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DISEASES CAUSED BY BACTERIA AND FUNGI.

ALTARA, I. (1933). Sull'efficacia del vaccino antistafilococcico nella terapia e nella profilassi della dermatite pustulosa mammaria degli ovini e dei caprini. **[The Efficacy of Anti-Staphylococcic Vaccine in the Treatment and Prevention of Pustular Dermatitis of the Mammary Gland in Sheep and Goats].** —*Nuovo Ercol.* **38.** 61-64.

Investigations carried out during the period 1927 to 1929 have enabled the author to establish the existence of the classical gangrenous mastitis of sheep and goats caused by the micrococcus of Nocard, pustular dermatitis of the mammary gland due to a staphylococcus, and mastitis which is sometimes associated with a pustular dermatitis caused by "*Bacillus pyogenes ovis.*" The second of these is of widespread occurrence and is the cause of serious losses. It is clearly impossible to resort to individual treatment by means of medicaments. The author has therefore prepared a vaccine from a number of strains of the staphylococcus. The vaccine would appear to be a live one as there is no mention of any method being used to kill it, and it contains 2,000 million organisms per c.c.

The dose was 2 c.c. injected subcutaneously. It is said that during treatment there is definite improvement after the second injection, and that cicatrization has occurred in seven or eight days. The injections are given at intervals of three to four days. It is claimed that the vaccine has produced a practical degree of resistance in 95 per cent. of non-infected animals. Two doses are given at intervals of five or six days. Autogenous vaccines appeared to be superior to stock vaccines.

—A. LESLIE SHEATHER.

I. LESBOUYRIES, & ADAM. (1933). Diagnostic de la mammite streptococcique de la Vache, par la séro-agglutination. **[The Diagnosis of Bovine Streptococcic Mastitis by Sero-Agglutination].**—*Bull. Acad. vét. France.* **6.** 61-66. 2 tables. [8 refs.]

II. LESBOUYRIES, & ADAM. (1933). Le pouvoir hémolytique des streptocoques isolés des mammites de la Vache. **[The Haemolytic Power of Streptococci isolated from Mastitis in the Cow].**—*Ibid.* 78-83. 1 table. [16 refs.]

I. From a comparison between the results of cultural tests and agglutination tests carried out in 2 herds of 12 and 20 animals respectively, the authors conclude that a serum agglutination test provides a useful method for the detection of latent streptococcic mastitis. It has the advantage that only one test is needed for each cow and that this can be made during the dry period. The result must only be

considered positive, however, when agglutination occurs at 1 : 100, because agglutination at lower dilutions is frequently given by cows whose milk shows no organisms or only micrococci. No history of these animals is given. The highest titres recorded are 1 : 200 to 1 : 300.

II. A study of the haemolytic activity of 39 strains of mastitis streptococci was made by adding various numbers of drops of an 8-hour culture in 10 % horse serum broth to 1 c.c. of 10 % washed sheep cells and incubating at 37°C. for one hour. Eleven strains were non-haemolytic and 28 haemolytic, 5 of the latter being feebly haemolytic, 12 moderately haemolytic and 11 strongly haemolytic.

A retest of 20 of these strains after 6 to 8 subcultures showed a striking decrease in haemolytic power, 14 being then non-haemolytic and only 6 haemolytic, whereas originally only 4 were non-haemolytic and 16 haemolytic. The authors believe that haemolytic activity is not constant and may change in the udder.

—A. W. Stableforth.

Orre, B. (1933). Les mammites et la traite mécanique. [**Mastitis and Machine Milking**].—*Le Lait.* **13.** 444-452. 2 figs.

The author, who is a member of the well-known firm of Alfa-Laval, considers fully the effects of machine-milking on the propagation of bovine mastitis and on the course of latent infections of the udder.

Attention is given to the type of cup and its action, the degree of suction employed, to their immediate or cumulative effects, and to the necessity of stripping after removal of the machine. It is not possible to give an adequate abstract of the contribution. The author's views are, however, largely summed up in the concluding paragraph : If the change from hand to machine-milking can, under favourable conditions and in animals which are particularly sensitive, cause a lighting up of latent disease, that is not altogether a disadvantage, because dairy farmers are under an obligation to give their full attention to latent mastitis. It is the ignorance of the farmer which is responsible for the extent of the disease and is the principle obstacle to its eradication.—A. W. Stableforth.

Grossman, H. (1933). Untersuchungen über das Vorkommen von Bakterien, insbesondere von Streptokokken bei weissen Mäusen, zugleich Beiträge zur Streptokokkenfrage. [**The Occurrence of Bacteria, especially Streptococci, in White Mice, with Contributions on Streptococcal Questions**].—*Zlb. Bakt. I.* (*Orig.*). **127.** 225-253. 9 tables. [31 refs.]

A search for bacteria was made in the blood and various organs of 31 mice, material being plated on blood agar after enrichment in glucose broth. Bacteria were found in all mice save one, in most cases in several organs. Streptococci were most frequently present, particularly in the lungs. The majority of these were of the *Str. lactis* variety, a few " simulated " *Str. pyogenes.*

Intensive irradiation of the mice had no effect on the frequency of streptococci. It is claimed, however, that some increase of virulence and invasive power was produced by various bacterial irritants. Attention is drawn to the similarity of these normal streptococci to certain pneumococcus variants and the possibility of confusion arising. The question of the " unity of streptococci " is discussed.

—A. W. Stableforth.

Neufeld, F., & Etinger-Tulczynska, R. (1932). Untersuchungen über die Pneumokokkenseuche des Meerschweinchens. [**Experiments on Pneumococcus Epidemics in Guinea Pigs**].—*Zschr. Hyg. u. Infektkr.* **114.** 324-346. 8 tables. [22 refs.]

The purpose of this work, which extended from 1930 to 1932, was to study the epidemiology of the disease and the possibility of its control. The methods used were similar to those detailed earlier [(1931). *Zschr. Hyg. u. Infektkr.* **112.** 492].

From a study of over 300 guinea pigs from various sources it is concluded that pneumococci do not belong to the normal flora of the guinea pig's nasal membranes but are very widespread, being in that way similar to pasteurella in rabbits. The pneumococci which gain entrance may increase in a limited manner for a short time only or may increase rapidly, often to the exclusion of other bacteria, and cause a catarrhal condition which may remain for months. Such animals are the chief means by which the disease is spread, directly or indirectly. The actual result in a given animal seems to depend upon individual disposition and not upon age, but is affected by such factors as cold, dietary deficiency and pregnancy. It is believed that repeated infection of guinea pigs with pneumococci increases their susceptibility. Discussing other infections in the light of their findings in guinea pigs, the authors conclude that a certain pathogenic organism—even in virulent form—may be present on the mucous membranes of human beings for a shorter or longer time without harm, but that a new infection with the same organism can have the most serious results.

The collection of nasal washings is considered essential for the determination of carriers in any endeavour to free a stock of guinea pigs from infection. Attempts to protect by means of killed vaccines were without marked result.

—A. W. Stableforth.

Pokschischewsky, N. A., & Golowin, A. D. (1933). Der Milzbrand als Erdbodenepizootie. Ein experimenteller epizootologischer Forschungsversuch. [**Anthrax as an Earth-borne Epizootic. An Attempt at Experimental Epizootological Research**].—*Zschr. Infektkr. Haust.* **43.** 93-99. 2 tables.

The authors point to the lack of experimental work on the relations between the presence of *B. anthracis* and the soil. The present article deals with experiments carried out to ascertain the effect of the hydrogen-ion concentration, the surface temperature, the humidity of the soil and rainfall on the anthrax bacilli in the soil. The tests, covering a period of 4 years, were performed in 3 villages of the U.S.S.R., Karelia, where heavy losses due to anthrax have occurred within the last 50 years. The results, which are tabulated, show that cases of anthrax occurred on marshy peat soil, the humidity of which was not lower than 80 % and the pH of which ranged between 5·3 and 6·4. The monthly total of the surface temperatures of the soil which favoured the outbreak of the disease proved to be 445° to 598° and higher. [Readings of the local meteorological station—presumably in tenths and therefore 44·5° to 59·8°C.—Ed.]

The examinations of the soil for *B. anthracis* were positive 2 to 4 weeks before the first cases of anthrax occurred among the cattle grazing on this pasture. Should this observation be confirmed by further investigations, the authors believe that it is possible to predict an outbreak of the disease 2 to 4 weeks later by means of systematic examination of the soil. In this time it would be possible to protect the stock by immunization.

The authors develop the following working hypothesis :—the anthrax organisms are able to multiply in the soil under certain favourable conditions which may be present for some time during the year and these soil growth organisms give rise to the outbreaks of the disease. The multiplication of the organisms, however, can be suppressed for some time by the action of an unknown factor. It is assumed that the products of the decomposition of the quickly growing

organisms, adsorbed on to soil particles, suppress the further multiplication of the bacilli. If these products of decomposition are washed out by rain or have lost their toxic effect in some way, the surviving anthrax spores are able to germinate again.

The authors consider that it may be possible to prevent the germination of the anthrax spores or the multiplication of the organisms in future by means of a regulation of the biological conditions of the soil.—R. WETZEL (HANOVER).

BARTELS. (1933). Ergebnisse der Versuche mit der intrakutanen Milzbrandschutzimpfung nach Besredka im Reg.-Bez. Schleswig im Jahre 1932. [**Results of the Tests with Besredka's Intradermal Anthrax Vaccine in the District of Schleswig in 1932**].—*Deuts. tierärztl. Wschr.* **41.** 417-418.

This is the author's third annual report on the use of intradermal anthrax vaccination. In April, 1932, 268 cattle were given a double inoculation at the root of the tail at a 14-day interval and 125 cattle and 11 horses were given a single inoculation. No case of anthrax has since occurred in these animals.

The district, which contains some big tanneries, has had a large mortality from anthrax in recent years. The author gives tables showing the mortality from 1924 to 1932; since 1929 the incidence of anthrax has been low.—J. E.

HARNACH, R. (1933). Anthraková epidemiologie v údolí potoka Plesné (okr. Cheb); úloha odpadních vod kozeluzenskych a jich čistení. [**Epidemiology of Anthrax in the Valley of Plesná Brook (District of Cheb); Part played by the Effluents from Tanneries and Methods of Purification**].—*Zverol. Rozpravy. Suppl. Zverol. Obzor.* **7.** 78-84, 86-94 and 103-108. 1 table, 1 map, 1 graph. [18 refs.]

Numerous cases of anthrax, which occurred many years ago epidemically among cattle in farms situated near the Plesná Brook, led the author to search for the source of the infection. In the vicinity of the brook was a leather factory, which discharged its effluents into the stream. The number of infected cattle was highest before the war because the factory used large numbers of imported hides and the sanitary measures devised for the purification and disinfection of the effluents were ineffective. During the war the infection of cattle was minimal because the importation of foreign hides was stopped. In the first years after the war the incidence of anthrax among cattle increased again, but, as the sanitary measures in the factory improved, it gradually diminished.

The author calls attention to the fact that the chemical disinfection of tannery effluents is still a problem and says that such effluents should be submitted to periodical bacteriological tests.—E. PRIBYL (BRNO).

BOQUET, A., & SAENZ, A. (1933). Sur le mécanisme de l'infection charbonneuse. [**The Mode of Infection in Anthrax**].—*Ann. Inst. Pasteur.* **50.** 311-338. 6 tables. [34 refs.]

The authors give an account of their researches into the comparative receptivity of tissues in general to anthrax infection.

They find that, contrary to the opinion expressed by BESREDKA, the skin does not possess an exclusive affinity for the anthrax bacillus, as anthrax may result from infection of other tissues. The cellular reactions which follow skin infections may even retard or hinder the dispersion of the bacilli, causing only a local reaction which may heal spontaneously.

In the guinea pig, the subcutaneous and submucous tissues have been shown to be receptive and, measured in terms of the anthrax second vaccine, the sub-

cutaneous tissue appears to be 4 to 5 times less receptive than the skin.

The bacillus can also set up anthrax septicaemia following inoculation by the nasal route. Such aerogenic infection occurs in wool-sorters and rag-pickers.

Spores of anthrax second vaccine inoculated into the peritoneal cavity of guinea pigs are, to a large extent, destroyed in the serous fluid and omentum and also in the spleen and liver, which organs they quickly enter. Fatal results are not due to skin infection, but to the multiplication of the bacilli in these organs.

The healthy mucosa of the digestive tract is not very permeable to anthrax spores, but a few can occasionally be demonstrated in the circulation, by blood culture, after the administration of large doses by the mouth. In the blood the spores are rapidly destroyed by phagocytes unless, perchance, whilst being carried in the circulation they obtain access to injured tissues, when they give rise to anthrax just as if the bacilli had been directly inoculated into the tissues. It is thought that anthrax infection in the large animals follows this course.

—GWILYM O. DAVIES.

RAUTMANN, H. (1933). Die Rindertuberkulose in der Provinz Sachsen in Jahre 1932 und Massnahmen zur Bekämpfung der Seuche. [**Bovine Tuberculosis and Control Measures in Saxony in 1932**].—*Deuts. tierärztl. Wschr.* **41.** 449-456. 7 tables. [10 refs.]

An account of the work of the Bacteriological Institute of the Chamber of Agriculture for Saxony. Over 778,000 head of cattle are included in the voluntary control scheme and in 1932 the number of tuberculosis-free farms had risen to 82 %. Two methods of control are employed, the ordinary clinical examination method and the " accelerated " method in which both clinical and bacteriological tests are used. The number of tuberculous animals found by the latter was about 10 times the number found by the ordinary method. The bacteriological tests deal with examination of secretions and excretions—lung mucus, milk, uterine mucus and faeces—and are a great help in diagnosis. The author found the tracheal canula more reliable than the bloodless methods of obtaining lung mucus. About 5,000 tuberculous animals were found during the year and killed, compensation being paid.

The various aspects of the work are described fully and illustrated by tables.

The latter part of the paper is devoted to a discussion of technical problems occurring in the work : the following are referred to :—culture media for *Mycobact. tuberculosis* (DAHMEN's method—(1916). *Tierärztl. Rdsch.* **22.** 373.—is considered to be useful), the prevention of contamination of cultures by the addition of chemicals (HCl preferred to antiformin for preliminary treatment of seed material), estimation of the importance of lesions in guinea pigs used in diagnosis, the bacterial content of some commercial tuberculins, Menck's complement-fixation reaction for milk (considered valuable for individual samples), the diagnosis of uterine tuberculosis, the examination of centrifuged milk sediment for infection and the use of Friedmann's vaccine (found to have no curative value for fowls).—J. E.

VITTOZ, R., & SOUCHARD, L. (1932). Bacille tuberculeux bovin en Cochinchine. [**Bovine Tuberculosis in Cochin-China**].—*Bull. Soc. Path. exot.* **25.** 1026-1032. [4 refs.]

This communication comprises a brief review of recorded cases of tuberculosis in Indo-China and an account of a laboratory investigation directed to ascertain the precise cause of certain bovine lesions seized in the abattoir at Saigon.

The authors point out the extreme rarity of the disease in the country and record the details of these cases as of particular interest.—GWILYM O. DAVIES.

I. STEVENS, W. S. (1933). **The Bovine Tuberculosis Problem and a Six Year Plan of Eradication.**—*Vet. J.* **89.** 55-61. 1 map.

II. WIGHT, A. E. (1933). **Progress of Cooperative Tuberculosis Eradication Work.**—*J. Amer. Vet. Med. Ass.* **82.** 420-432.

I. In this paper the author outlines his plan for the elimination of tuberculosis from Great Britain. He proposes that the country be divided into three divisions, each of which would be dealt with in overlapping rotation, eradication in each area being completed in six years. During the first two years, clinical examination of cattle and microscopic examination of milk, together with attention to hygiene, would form the basis of procedure. During the second two-year period, the area would be tuberculin tested and the reactors segregated or slaughtered; and during the final two-year period, only milk originating from cows which had passed the tuberculin test would be allowed to be sold for human use within the area.

It is proposed that the cost of the project should be defrayed from a sweepstake fund, but that the cost of testing in the final two-year period should be borne by the cattle owner.

II. This annual survey of tuberculosis eradication in the U.S.A. is largely a summary of statistics, from amongst which the following are of general interest :—during the last 15 years, 106,254,598 cattle have been tested and 2,514,875 reactors detected. The approximate incidence of the disease in cattle has steadily fallen from 4% in 1922 to 1·4% in 1933. Referring to swine, Wight states that the number of carcasses condemned for tuberculosis has decreased by approximately 50%.

The value of tracing the source of infected meat and the testing of such sources of origin is stressed ; it is mentioned that in the case of retests of accredited herds and the testing of cattle for interstate shipment, this work is done by local practising accredited veterinarians.

Reference is made to " Special F " tuberculin, and also to sodium orthophenylphenate, a non-odourous disinfectant, both of which have been developed by the Bureau of Animal Industry. In the ensuing discussion the importance of thorough disinfection of premises after removal of reactors was urged.

—EDWARD F. PECK.

GMINDER, A., & SICKMÜLLER, E. (1933). Die Endometritis tuberculosa und ihre Bedeutung für die Erkenntnis und Bekämpfung der Rindertuberculose. **[Tuberculous Endometritis and its Significance in Relation to the Knowledge and Control of Tuberculosis of Cattle].**—*Deuts. tierärztl. Wschr.* **41.** 193-197. [5 refs.]

In a recent investigation by state veterinary officers, all cows whose calves were condemned as tuberculous were submitted to a rigorous examination for tuberculosis. The results showed that a very small percentage of these dams were excreting tubercle bacilli in their milk. The authors consider that congenital tuberculosis is far more common than is generally believed. They do not think that sufficiently careful *post-mortem* examinations of the uteri are usually carried out. During life, tuberculous endometritis may not cause symptoms and at *post-mortem* examinations the only lesions discernible may be pin-head yellow-grey foci of necrosis in the depth of the mucosa. Unless a careful search for lesions of this type is made they will be missed, whilst microscopic examination of mucus cannot be relied upon to reveal acid-fast bacteria ; it is necessary to make smears of the lesions themselves.

The well-known chronic lung tuberculosis of cattle would appear to be the result of reinfection and is not congenital in origin.—E. J. PULLINGER.

NINNI, C., & BRETEY, J. (1933). Sur les différences observées dans la multiplication des trois types de Bacilles tuberculeux dans le sang citraté de l'Homme ou du Lapin. [**Differences in the Multiplication of the Three Different Types of Tubercle Bacillus in Human or Rabbit Citrated Blood**].—*C. R. Soc. Biol. Paris.* **113.** 572-575.

These experiments were devised to determine whether tubercle bacilli would develop in citrated blood. Decreasing amounts of tubercle bacilli commencing with 1 mg. and falling to 0·001 mg. were added to 4 c.c. of citrated blood (human or rabbit) and incubated at 37°C. for periods of 1, 3, 6, 14 and 28 days respectively. The mixtures were then sown on to Löwenstein's medium. The combinations examined were normal human blood with human, bovine and avian bacilli respectively, and normal and tuberculous rabbit blood with the same strains. It was found that multiplication of all 3 types took place. They could be distinguished, however, by the fact that the avian type developed very readily, the human type fairly abundantly and the bovine type sparsely.—R. E. GLOVER.

VAN ES, L. (1933). **The Three Types of Tubercle Bacilli in Live Stock Sanitary Control Work.**—*J. Amer. Vet. Med. Ass.* **82.** 407-420. [8 refs.]

This paper is one in a symposium on tuberculosis, and was presented at the 36th Annual Meeting of the United States Live Stock Sanitary Association. It is a broad review of the problems which have to be faced in the eradication of bovine tuberculosis, particularly in a country where the nation-wide system of eradication is now beginning to show beneficial results. Whole states and large areas within other states have had their tuberculosis incidence reduced to a bearable minimum. The problem of achieving freedom from the infection has been replaced by one of keeping free from it, and the author visualizes the latter phase of the situation. In this connection we must keep in mind that in its essentials tuberculosis eradication can mean but one thing, namely, the destruction of the causative organism. Thus, as the incidence of tuberculosis in bovines decreases, the necessity of a careful watch being kept on sources of tubercle bacilli from other species of hosts increases. Human beings, swine, horses, goats, sheep, dogs, cats and a number of pet animals and captive wild species may, and more or less constantly do, supply the bovine bacillus with suitable host conditions for its propagation ; for example, in 9 cases of bovine infection encountered in a series of cases of human tuberculosis, 6 pertained to renal tuberculosis, eliminating the bacilli in the urine. Such heterologous hosts might then be responsible for the introduction of bovine tuberculosis into clean herds. Conversely, a case of human tuberculosis in cattle is instanced in an animal born on a farm where a positively reacting animal had never before been found. This farm is situated on an isolated island where tuberculosis control is being maintained and where, during the previous four years, no positive reactions to tuberculin had been encountered.

Spontaneous infection of swine, cats and monkeys with the human type has occasionally been found. There is danger of mammals becoming infected with the avian type of bacillus. In this connection the marked increase in the condemnation of swine in inspected abattoirs in America from 1907 to 1922 was due to infection with the avian type, and it has also been shown that this type may initiate tuberculosis in cattle.

In virtue of these facts, and numerous other arguments, the author states that all problems connected with tuberculosis are closely related, perhaps more so than we have reason to believe at this time. All tuberculoses, regardless of the type involved, have as their primary cause only one specific organism, *Mycobact. tuberculosis*, possessed of a remarkable genetic plasticity and of a conspicuous

power of adaptation. This fact alone is an indication that, in the general efforts of eradication, livestock sanitarians should remain apprehensive of what heterologous varieties may ultimately bring about.—W. S. GORDON.

JENSEN, K. A. (1932). Undersøgelser over, hvilken Betydning man maa tillaegge de tre Tüberkelbaciltyper, T. humanus, T. bovinus og T. gallinaceus som Aarsag til Tuberkulosen hos Menneskit her i Landet. [**Investigations into the Importance of the Human, Bovine and Avian Types of the Tubercle Bacillus in the Production of Tuberculosis in Man in Denmark**].—*Ugeskr. f. Laeger.* **94.** 681-688. 4 tables.

According to the research work carried out at the State Serum Institute (Copenhagen) during the last nine years, it is stated that the avian type is of no special importance as a cause of typical tuberculosis in man. 400 strains were isolated in pure culture from different tuberculous lesions. For the differentiation of the type, a technique was used based upon the work of A. S. GRIFFITH.

A special technique was elaborated by which it is possible to differentiate the type of tubercle bacillus within four weeks. The practitioner who has forwarded material for examination may hereby obtain knowledge of the type that has produced the disease in the case under consideration, and then control the right source of infection.

The result of the differentiation of the types of tubercle bacilli was as follows (it must be borne in mind that the material examined is still relatively small) :—

(1) Pulmonary tuberculosis and surgical tuberculosis, with the exception of tuberculous adenitis of the throat and urogenital tuberculosis, are due to the human type in the great majority of the cases.

(2) Tuberculous adenitis of the throat is caused by the bovine type in the great majority of the cases both in Copenhagen and in the rural districts.

(3) In 19% of cases, urogenital tuberculosis is produced by the bovine type.

(4) Tuberculous meningitis is caused by the bovine type in 24% of all cases ; it causes more than half of the cases in children under five years old (in Denmark 142 cases of this kind occur yearly).

From these investigations it is concluded that :—

(1) Infection with the human type takes place from man to man and open pulmonary tuberculosis is the source of infection in the great majority of cases.

(2) Infection with the bovine type nearly always takes place from cattle to man and milk must be regarded as the most active source of infection.

The author discusses the differentiation of the types of tubercle bacilli in the total number of cases of tuberculous meningitis occurring in Denmark over a long series of years, in order to study if the bovine infection is progressive or retrogressive and also to ascertain if the prophylactic measures undertaken are sufficient.

Moreover such investigations might point out the districts wherein bovine infection is most widely spread.

Finally, practitioners are invited to forward material from cases of tuberculous meningitis to the State Serum Institute.—H. LORENZEN (SONDERBORG).

BELLER. (1933). Vorkommen von Tuberkelbakterien in Hühnereiern. Erwiderung zu den Ausführungen von Professor Klimmer. [**The Presence of Tubercle Bacilli in Hens' Eggs. A Reply to the Article by Professor Klimmer**].—*Berl. tierärztl. Wschr.* **49.** 149-150. 1 table. [5 refs.]

Reference is made to criticism levelled by KLIMMER [see this *Bull.* **3.** 663.] at an investigation carried out by the author [BELLER & HENNINGER. (1930). *Arch.*

Geflügelk. **4.** 453.] on the examination of 620 eggs from 30 hens, 3 of which were known to be tuberculous. The tuberculous hens laid 62 eggs, 2 of which were contaminated with tubercle bacilli. The remaining 618 eggs did not contain this organism.

KLIMMER suggested that, though 3 hens were tuberculous, probably only one was showing infection of the egg-laying apparatus, and that only the eggs laid by this one fowl should be considered in estimating the percentage of infected eggs laid by tuberculous fowls. A calculation upon such a basis (i.e. 2 contaminated eggs out of 20 to 25 laid by one fowl) would result in a figure of 8 to 10%. KLIMMER further referred to criticism raised by LICHTENSTEIN [(1932). *Zschr. Tuberk.* **64.** 245.] of the technique used by Beller.

Replying to the above, Beller supported his low findings by giving figures of 3 other sets of workers [also quoted by KLIMMER] all of whose findings approximate to 0·5% of eggs laid by tuberculous fowls being infected with tubercle bacilli. [In all, 7 out of 1,248 eggs were infected].

Furthermore, whilst he does not claim for his own technique the degree of sensitivity claimed by LICHTENSTEIN, yet he contends that his methods are adequate.—E. J. PULLINGER.

CUMMING, W. M. (1933). **Pulmonary Tuberculosis in Dairy-Farm Workers and Others Coming much in Contact with Cattle.**—*Tubercle.* **14.** 205-207. [6 refs.] [Reprinted in *Vet. J.* **89.** 154-157].

In 1932 the author reported 14 cases of phthisis in persons coming in contact with cattle and in this paper gives the results of his bacteriological diagnosis, from which it transpires that only 4 of these cases were infected with the bovine tubercle bacillus. The 4 case records are given ; since the lesions were thoracic, it is difficult to incriminate tuberculous milk. LANGE [(1931). *Zschr. Hyg. u. Infektkr.* **39.** 298.] put forward the view that pulmonary tuberculosis of bovine origin in persons coming in contact with infected cattle may be a consequence of air-borne infection from beast to man.—J. E.

FEJGIN, B., & PROKOPOWICZ-WIERZBOWSKA, M. (1933). Sur les variations morphologiques du Bacille tuberculeux BCG dans l'appareil digestif des nouveau-nés. [**Morphological Variations in the BCG Organism in the Digestive Tract of New-Born Children**].—*C. R. Soc. Biol. Paris.* **112.** 602-604.

Organisms were separated from the faecal matter of BCG-vaccinated new-born babies by the method of VERNOT and MORAND, using sulphuric ether with flotation in ligroin solution [a hydrocarbon, see KOLLE, KRAUS, & UHLENHUTH, " Handbuch der pathogenen Mikroorganismen." **5.** 635.] and stained by Ziehl-Nielsen. After a single vaccination, typical acid-fast bacilli were found : after a second inoculation, non-acid-fast granules and clubbed forms appeared. These unusual morphological forms were subsequently produced in culture.—E. J. PULLINGER.

LIVERANI, E. (1933). Recherches sur le pouvoir antigène des émulsions de divers Bacilles tuberculeux vivants et morts. [**Research on Antigenic Power of Emulsions of Different Living and Dead Tubercle Bacilli**].—*C. R. Soc. Biol. Paris.* **113.** 46-48.

The study of antibodies in the blood of those suffering from tuberculosis by the Bordet-Gengou reaction, although it may not possess the diagnostic importance of the Wassermann reaction for syphilis, nevertheless furnishes useful indications in the study of antituberculosis immunity. The author has attempted to titrate the antibodies produced in rabbits as the result of intravenous inoculation of

various antigens composed of tubercle bacilli prepared in accordance with the technique of CALMETTE and MASSOL. These have included 7 different cultures of tubercle bacilli living or killed by heat at 80°C. for half-an-hour ; living and dead BCG ; human attenuated bacilli (type Saranac, R^1) living and dead ; dead avian, bovine and human bacilli. He found that the reinoculation of a small dose of the same antigen strongly increased the production of antibodies, if the reinoculation was made at the time when the products of the initial injection had attained their maximum titre, but no augmentation was brought about if the injection was made before the maximum was reached. Living bacilli were found to possess antigenic properties definitely greater than dead bacilli.—LL. E. W. BEVAN.

I. —. (1932). **Spahlinger Treatment of Tuberculosis.**—*Brit. Med. J.* Feb. 6th. 252-254. [2 refs.]
II. —. (1932). **The Spahlinger Vaccines.**—*Ibid.* Feb. 13th. 297-298. [1 ref.]
III. SPAHLINGER, H. (1932). **The Spahlinger Vaccines.**—*Ibid.* Feb. 27th. 401.
IV. HORDER, T. (1932). **The Spahlinger Remedies.**—*Lancet.* **222.** 482.

I. Refers to a meeting held at a private house in London at which SPAHLINGER made known the method of preparation of his vaccine.

II. Discusses some points in connection with the preparation of Spahlinger's vaccine and recommends that, should it be considered desirable to give the vaccine a trial either in human beings or in animals, a committee should be convened to draw up a plan of campaign, as indiscriminate use will give rise to a waste of time, energy and material.

III. In this letter to the editor, Spahlinger refers to a statement which appeared in an editorial in the [(1932). *Brit. Med. J.* Feb. 13th. 297.] in which it was apparently stated that there was such a wide difference between BCG vaccine and Spahlinger vaccine that " if one can confer immunity, the other cannot." He discusses the two methods.

IV. Horder draws attention to a sentence which appeared in an editorial in the [(1932). *Lancet.* **222.** 295.] which he considers has been wrongly interpreted. The sentence was " Mr. Spahlinger may safely join the freemasonry of bacteriologists who share their knowledge for the benefit of medicine and mankind." Horder's interpretation of the sentence, which is confirmed by the editor of the *Lancet*, is that Spahlinger has not yet qualified for the brotherhood.—T. M. DOYLE.

PAWLOWSKI, E. (1933). Ueber den gegenwärtigen Stand des menschlichen Schweinerotlaufs. [**The Present State of Swine Erysipelas Infection in Man**].—*Berl. tierärztl. Wschr.* **49.** 408-410. 2 graphs. [3 refs.]

A review of the literature on ROSENBACH'S " erysipeloid " in human beings, which is now considered to be caused by the organisms of swine erysipelas or mouse septicaemia, both biologically similar.

In human beings the condition is most common in those who work with animals and animal products and is characterized by an erysipelas-like swelling with reddish-blue discolouration of the fingers ; it sometimes spreads above the hand and cases of general infection have been observed.

According to the author's statistics made at the surgical clinic of Berlin University, the condition is much commoner in women and was more frequently seen in the few years after the war.

Methods of symptomatic treatment are described.—J. E.

PAULSON, M., & BROWN, J. H. (1932). **The Appearances Produced in Blood Agar by Bacteria of the Bacterium coli Group.**—*J. Infect. Dis.* **51.** 407-411.

2 figs. on 1 plate, 1 table. [10 refs.]

Observations on 60 strains of the coli-aerogenes group of bacteria are recorded according to their colonial appearances in deep blood agar plates. Various types of haemolysis are described, similar to the α, α prime, β, γ and δ types of streptococci. [The habit of describing neither haemolysis nor discolouration of the blood surrounding the colony as "γ haemolysis" persists, whilst the δ type appears to be a non-haemolytic variety showing greenish discolouration only]. It is stated that the determination of the type of appearance in blood agar should be a useful adjunct to the study of the bacilli of the *Bact. coli* group.—R. LOVELL.

JUNGHERR, E., & PLASTRIDGE, W. N. (1933). **Epidemic Infection of Guinea-Pigs with Salmonella Enteritidis.**—*J. Infect. Dis.* **52.** 413-419. 2 tables. [15 refs.]

Two epidemics in guinea pigs are described, both of which appear to be caused by *Bact. enteritidis* or some organism closely related to it. Segregation of the animals on the basis of the agglutinin content of the serum of the guinea pigs was unsuccessful as a measure of control. As members of the salmonella group may produce a disease in rodents easily confused with pseudotuberculosis, the authors made a plea for the use of the term " paratyphoids " and to reserve the term " pseudotuberculosis " for the condition produced by " *B. pseudotuberculosis rodentium*," which, they state, is variously classified as belonging to the genus *Pasteurella* or to the genus *Corynebacterium*. [A serious error is made here although the confusion can be traced to the classification of Bergey. There are several species of bacteria known as " *pseudotuberculosis* " :—(1) *Past. pseudotuberculosis*, a Gram-negative bacillus previously known as " *B. pseudotuberculosis rodentium*," and the cause of pseudotuberculosis in rodents, particularly in guinea pigs ; (2) *Corynebact. pseudotuberculosis ovis*, a natural pathogen of sheep, and probably identical with that found in horses, and (3) *Corynebact. pseudotuberculosis murium*, a natural pathogen of mice].—R. LOVELL.

THORP, F., Jr., & GRAHAM, R. (1933). **The Rapid Spread of Bang's Disease in an Accredited Herd.**—*J. Amer. Vet. Med. Ass.* 749-752. 1 chart.

In this paper the authors show the rapidity with which Bang's disease can spread in an accredited herd. In the state of Illinois, accredited herds are protected against the introduction of infection by ensuring that additions come from accredited herds or by using unbred heifers from non-accredited herds after a period of quarantine and testing.

In the herd which forms the subject of this paper, *Br. abortus* infection occurred in an unexplained manner despite the fact that breeding animals had not been added to the herd for a period of 5 years preceding the appearance of the disease. For 3 years all the animals gave negative results, then one cow aborted at pasture, proved positive to the agglutination test and was immediately removed. Two months later the entire herd was tested and 2 reactors found. In the next 2 months, 13 new reactors developed and monthly tests in the course of the subsequent year revealed a further 27 reactors. Over a period of 2 years, approximately three-fifths of the non-reacting animals of breeding age reacted to the agglutination test.—GWILYM O. DAVIES.

—. (1932). **Committee on Contagious Abortion. Report on the Schomberg and Bradford Areas and Individual Herds for the Year 1931-32.** pp. 1-41. 5 tables. Toronto : Ontario Research Foundation.

This report deals with the progress made during 1931-1932 in the eradication

of bovine contagious abortion by means of blood tests and isolation or disposal of reactors in the Schomberg and Bradford areas, Ontario. 56 farms and 17 small holdings were included in the scheme. Farmers, before entering the scheme, were obliged to sign a declaration agreeing not to breed from reactors to the test.

Before adopting the blood testing and isolation scheme, live abortion vaccine was used, but the results obtained were not satisfactory.

The eradication scheme is giving good results and has proved the superiority of clean animals over those infected with *Br. abortus*. Breeding troubles were considerably more prevalent among the reactors than among the clean animals.

The report contains much information and includes details of the results of the agglutination tests in individual herds.—T. M. Doyle.

I. Sheather, A. L. (1933). **The Control of Contagious Abortion.**—*Vet. Rec.* **13.** 491-494.

II. Tutt, J. F. (1933). **Vaccination against Contagious Bovine Abortion.**—*Ibid.* 494-498.

I. The author discussed the two principal methods employed for the control of bovine contagious abortion, i.e. blood tests and segregation, and vaccination. He pointed out that the detection and segregation of "carriers" is by far the more important as it aims at the eradication of the disease, whereas vaccination aims only at reducing losses at the price of perpetuating the infection in the herd and should, therefore, be used only as a last resort. There is considerable evidence to show that dead vaccines are of no practical value, although they produce a transitory antibody response. Live vaccines are of some value, but it has not been proved that their use can bring about eradication of the disease. Vaccination should be strictly confined to infected herds.

II. Tutt records the results obtained from a questionnaire sent to owners of abortion-infected herds in which live vaccine had been used over a number of years. 11 owners furnished results and the evidence pointed to vaccination having reduced the rate of abortion. It did not appear to exercise any appreciable effect on fertility.—T. M. Doyle.

I. Cotton, W. E., Buck, J. M., & Smith, H. E. (1933). **Efficacy and Safety of Abortion Vaccines Prepared from Brucella abortus Strains of Different Degrees of Virulence.**—*J. Agric. Res.* **46.** 291-314. 5 tables.

II. Cotton, W. E., Buck, J. M., & Smith, H. E. (1933). **Efficacy of an Avirulent Strain of Brucella abortus for Vaccinating Pregnant Cattle.**—*Ibid.* 315-326. 2 tables. [4 refs.]

I. Indications are that *Br. abortus* living virulent vaccines may be a serious danger in creating carriers of infection in the udder. On the other hand live avirulent vaccines may be ineffective as immunizing agents. The authors' investigations were carried out to obtain more precise information. Vaccines were made from three strains, No. 11 which had been maintained in artificial culture for 12 years, No. 19 for 6 years, and No. 484 for 6 months. When tested upon guinea pigs subcutaneously and intraperitoneally No. 11 gave marked agglutination reactions but no visible lesions in 9 weeks; No. 19 gave stronger agglutination reactions and moderate lesions and No. 484 gave pronounced agglutination reactions and extensive lesions.

Three cows and 6 heifers were used for each vaccine and 9 heifers were kept as controls. After vaccination, temperatures rose gradually in 3 days to 105° or 106°F. but returned to normal in a further 3 days. By the 3rd day swellings had appeared at the inoculation site, up to 3 inches in diameter and

$\frac{3}{4}$ inch thick. The more virulent strain (484) produced more local disturbance. Breeding was commenced 2 months after vaccination. Samples of milk were tested weekly for a period of over 5 months upon guinea pigs to determine the presence of udder infection. The guinea pigs were killed 2 months after inoculation, examined for lesions and their blood sera tested for agglutinin. The inoculated cows and heifers were later exposed to *Br. abortus* infection by instillation of a virulent suspension of the organism into one eye. Detailed records of all the animals are given.

No real difference was indicated in the immunizing power of the 3 strains, but they differed from the standpoint of safety. The authors conclude that vaccines prepared from strains capable of causing virulent lesions in guinea pigs are likely to implant infection in the cows' udders and make them disseminators of the organism in the milk for long periods. Strains of reduced virulence are reasonably efficient immunizers and the danger of their setting up udder infection is slight.

II. These experiments were designed to investigate further the possibility of immunizing pregnant non-infected animals in infected herds by vaccination with an avirulent strain of *Br. abortus*. The strain used was incapable of producing lesions in guinea pigs, but retained its agglutinogenic value unimpaired. 19 pregnant cows and heifers were used, 9 of these being unvaccinated controls. The same methods were followed as described in the last series of experiments. The vaccine gave evidence of conferring some immunity. 60 per cent. of the vaccinated animals aborted or produced weak calves, whereas 89 per cent. of the control animals had similar histories.—S. H. GAIGER.

I. PRÖSCHOLDT, O. (1933). Die Feststellung der Ausscheidung von Abortus-Bang-Bakterien mit der Milch. [**The Determination of the Excretion of** *Br. abortus* **in the Milk**].—*Berl. tierärztl. Wschr.* **49.** 190-191. [1 ref.]

II. KARSTEN. (1933). Ueber die Ausscheidung von Abortusbakterien mit der Milch und deren Nachweis darin. [**On the Excretion of** *Br. abortus* **in the Milk and its Detection**].—*Ibid.* 191-192.

I. Pröscholdt, after discussing the relevant facts, puts forward the following procedure for the recognition of animals which are excreting *Br. abortus* in their milk :—(1) a blood test of all animals—it is assumed that vaccination has not been recently carried out ; (2) animals with a serum titre of 1 : 100 or less not to be regarded as excretors ; (3) animals with a serum titre of 1 : 4,000 to be regarded as excretors ; (4) in the case of cows with a titre from 1 : 100 to 1 : 200, milk samples are to be taken from each quarter—if the whey titre is 1 : 80 or over the animal is to be regarded as an excretor ; in other cases resort is to be made to cultural, or, if these are negative, animal inoculation tests ; (5) cows with a blood titre of 1 : 800 to 1 : 2,000 are to be similarly treated except that in these animals a whey titre of 1 : 20 is to be accepted as evidence of excretion of *Br. abortus*.

II. Karsten's views on many points are similar to those of PRÖSCHOLDT. He believes, however, that a whey titre of 1 : 10 should be regarded as positive evidence of excretion. He has found that, in infected herds, 24 to 70% of aborting animals, and 18 to 32% of animals which calve normally excrete the abortion organism for a year afterwards. 11% of excretors give a negative blood test and 10% a negative whey test. Cows which are excreting *Br. abortus* have in 61 to 100% of cases, according to the herd, both a blood and milk titre of 1 : 200 or over. In a guinea pig inoculated 4 weeks previously, Karsten accepts a blood titre of 1 : 40 as evidence of infection, otherwise he regards cultural tests of spleen tissue as necessary.—A. W. STABLEFORTH.

I. HENRY, B. S. (1933). **Dissociation in the Genus Brucella.**—*J. Infect. Dis.* **52.** 374-402. 2 figs., 1 table. [25 refs.]

II. HENRY, B. S. (1933). **Differentiation of Bovine and Porcine Strains of Brucella Abortus Based on Dissociation.**—*Ibid.* 403-406. 2 figs. [4 refs.]

I. The fact has now been well established that dissociation in the group of bacteria included in the genus *Brucella* is comparable with that exhibited in most bacterial species. Dissociation in stock cultures of the brucella group was first noted by BASSET-SMITH in his description of *Br. paramelitensis*, although he did not use the term dissociation in describing the self-agglutinating strains studied. The author describes 5 types of colonies in cultures of *Br. abortus* which are designated as S, I, R, RB and S^R and are said to be common variants in old stock cultures. Biochemical tests have failed to reveal significant differences in the reactions of the variants. The R forms of several strains of *Br. abortus* have proved relatively non-virulent for rabbits, guinea pigs and cattle, and they are but feebly agglutinogenic. No R forms were detected in the milk of a large number of cows. In all strains the S organisms are active antigens and most strains of *Br. abortus* which contain organisms of the S type are virulent for guinea pigs, rabbits and cattle. But, apparently, pathogenicity is not necessarily a characteristic of this type, as two strains which have been studied showed little or no invasive power even though they were predominantly of typical S type.

A detailed description of the variants, their occurrence, metabolism, pathogenicity and antigenic properties is given and should be studied in the original.

II. Although minor differences in the appearance and actions of the variants of the bovine and porcine types have been noted from time to time, these have, for the most part, been transient or have, on further investigation, been found to be common to several strains in each group. The author describes a method for the differentiation of such strains based upon the size relations of the R and S colonies. In the porcine strains the R colonies are said to be smaller than the S colonies, whereas the reverse is the case in bovine strains.—LL. E. W. BEVAN.

I. MALLMANN, W. L., & GALLO, F. (1933). **Studies on the Dissociation of the Brucella Group.**—*J. Agric. Res.* **46.** 267-279. 6 figs. on 1 plate, 8 tables. [13 refs.]

II. SMITH, T. (1933). **The Inter-Relation of Strains of Brucella.**—*Vet. Med.* **28.** 98-99.

I. The authors attempted to induce the change from S to R in strains of brucella by growth in 10% S antiserum and in 1% lithium chloride and by prolonged incubation on agar slopes at room temperature. The most satisfactory method appears to be by the process of "aging," the other two methods producing "OS" (smooth opaque) types, which are considered to be smooth types which, to a large extent, have lost the antigenic properties of an S form with a complete loss of pathogenicity. They appear to be easily reversed to S forms.

The R forms could not be classified in a manner similar to their S prototypes by the dye tolerance test, nor by the production of H_2S. No conclusions are drawn as to serological relationships, although the limited number of R forms studied indicated an antigenic association between the R forms of *Br. melitensis* and porcine strains of *Br. abortus*, with no association with bovine strains of *Br. abortus*. Neither form was agglutinated by serum prepared against its S prototype.

Living R forms, together with killed suspensions of their S prototype, were injected into guinea pigs and S forms recovered. The strains reverted to their original S form as tested by the dye tolerance test and the H_2S test. Furthermore,

the strains were agglutinated by the S immune sera.

II. A plea is made by the author for further investigation into contagious abortion and allied diseases. It is pointed out that goats, swine, sheep, horses and man may suffer from infection with brucella. Various tests, such as pathogenicity, CO_2 test, H_2S test and the dye or bacteriostatic test enable one to distinguish the swine, goat and bovine types. The fact that human beings are susceptible to one or other of these brucella strains forces the question of eradication, otherwise the author considers that the bovine disease would probably subside of its own accord as the bovine race becomes more resistant.—R. LOVELL.

TAYLOR, R. M., & HAZEMANN, R. H. (1932). Recherches épidémiologiques en cours sur la fièvre ondulante en France. Rapport préliminaire. [**Epidemiological Researches in Progress on Undulant Fever in France. Preliminary Report**].—*Rev. Hyg.* **54.** 481-524. 25 tables. [11 refs.]

The first part of this article deals with cases of undulant fever which were studied individually ; the second part reports a detailed study of the hygienic conditions of the entire population of several districts where undulant fever was prevalent.

Of 122 cases studied individually, 108 were attributed to the goat or the sheep, 3 to the cow and 2 to the mare ; whilst 1 was a laboratory infection and 8 were of undetermined origin. Of 108 cases attributed to the sheep or the goat, 10 had consumed raw milk or milk products but had had no contact with animals, 32 had been in contact only and 66 had been exposed to both sources of infection.

Amongst the population chosen for the general study (over a period of 5 to 7 years) the incidence of disease was 14% for persons over 15 years and 3% for those below that age, and was more than 3 times as high in males as in females. The possibility of infection by milk, etc. is not denied, but it is believed that it plays an insignificant part in the areas studied where the human and animal population live in direct contact.

All the strains of brucella isolated in the South of France have been shown by tests for production of hydrogen sulphide and for resistance to dyes to be of the *Br. melitensis* variety. In the districts studied, the disease is a serious problem both from the point of view of agriculture and of human health.

—A. W. STABLEFORTH.

I. —. (1933). **Discussion on Undulant Fever.**—*Proc. Roy. Soc. Med. London.* **26.** 1093-1106. 4 figs., 5 tables. [13 refs.]

II. CARPENTER, C. M., & BOAK, Ruth A. (1933). **Undulant Fever. Sources, Modes of Infection, and Prophylaxis.**—*Amer. J. Med. Sci.* **185.** 97-109. 4 tables. [23 refs.]

I. In a discussion on undulant fever by the sections of Medicine, Epidemiology and State Medicine of the Royal Society of Medicine in January, 1933, Sir Weldon DALRYMPLE-CHAMPNEYS expressed the opinion that this disease must no longer be regarded as a medical curiosity in this country, but as a definite clinical entity which, in spite of the bewildering variety of phenomena which it may exhibit, can, in most cases, be diagnosed on clinical grounds alone, though confirmation should always be sought from the laboratory. He described the world extension of the disease, and 115 well-authenticated cases which had occurred in England and Wales. He presented a table showing the occupation of 99 patients which indicated that only 13 persons, or 8 per cent. of the whole series, were farmers, farm workers or other persons living on farms. Of 83 cases, 78 were known to have consumed raw milk, whilst only 8 had been in

contact with bovines and 3 of these had drunk raw milk as well. He expressed the opinion that, if correct diagnosis is not always the prelude to successful treatment, it can at any rate save the patient from much useless and unpleasant therapy. WALKER HALL described the methods adopted to demonstrate the presence of *Br. abortus* in milks marketed in Bristol, which revealed that between 22 and 30 per cent. of raw churn milk contained *abortus* agglutinins. In an attempt to follow the distribution of the *abortus*-infected milk to the general population, they had examined the serum of 590 healthy persons and found agglutinins for *Br. abortus* present in 7 per cent. SINCLAIR MILLER advocated treatment by protein shock. MANSON-BAHR suggested that veterinary surgeons might have unwittingly spread the disease by wholesale preventive inoculations of milch cows with live cultures of *Br. abortus*. G. S. WILSON stated that laboratory evidence was definite that pasteurization—145° to 150°F. for 30 minutes—killed *melitensis* and *abortus*, but admitted that much of the pasteurization in this country was not carried out efficiently.

II. More than 100 cases of undulant fever in human beings are diagnosed each month in the United States, infection being attributed to the consumption of infected dairy products or to wound infection. Infection may also occur by way of the conjunctiva. The authors advocate the pasteurization of dairy products, the protection of those handling fresh meat by the disinfection of wounds and the wearing of rubber gloves, the vaccination of veterinarians and bacteriologists, and the elimination of infected livestock by the agglutination test.

—LL. E. W. BEVAN.

CLARENBURG, A., & VAN HEELSBERGEN, T. (1933). Necrobacillosis bij het Paard. [**Necrobacillosis in the Horse**].—*Tijdschr. Diergeneesk.* **60.** 240-244. 1 fig. [11 refs.] [Summaries in English, French and German : abst. from orig.] [German translation published in *Tierärztl. Rdsch.* **39.** 321-323].

A case record of necrobacillosis in a horse with a detailed description of the lesions found in the lungs and liver, in both of which multiple abscesses of bacillary necrosis were found. The diagnosis was confirmed by the histological method and the findings are fully described.—J. E.

JUNGHERR, E. L. (1933). **Observations on a Severe Outbreak of Mycosis in Chicks.**—*J. Agric. Res.* **46.** 169-178. 5 figs., 2 tables. [11 refs.]

This is an account of an outbreak of mycosis or " thrush " in which 10,000 chicks, less than 60 days old, were lost out of a commercial hatchery of 50,000 chicks.

The disease was characterized by the presence of whitish ulcers or pseudo-membranes in the crop, brownish or mucoid deposit in the proventriculus and ulcers in the gizzard. The lesions in chicks two to three weeks old were often too small to be recognized with the naked eye.

Mycological examination of the lesions revealed the presence of yeast-like fungi, of which there appeared to be three main types. *Monilia albicans* was recovered 38 times, *M. krusei* 15 times, and *Oidium lactis* 16 times.

The author succeeded in reproducing the disease in chicks by feeding with faecal material from diseased birds. *M. albicans* was recovered from the chief lesions and, in the opinion of the author, must be considered as the principal cause of the disease. Apart from the post-natal spread of the disease, the evidence in this outbreak appears to suggest that it can also be transmitted through the agency of the egg, probably on the shell.—GWILYM O. DAVIES.

DUBOVSKY, H. (1932). Ueber den Keimgehalt der Fruchtwässer und Föten gesunder Pferde und Rinder. [**Germ Contents of the Foetal Fluids and of the Foetuses of Healthy Horses and Cattle**].—*Tierärztl. Rdsch.* **38.** 459-463. [30 refs.]

The author examined 152 samples of amniotic and allantoic fluids from the uterus of 41 pregnant mares and 35 pregnant cows, all in the 18th to 47th week of gestation, as well as the associated foetuses for their bacterial content. The material was obtained from slaughter-house animals. Appropriate culture methods were employed with various foetal organs (stomach, intestine, liver, spleen, kidneys, testicles and ovaries) and with foetal fluids (agar and Gassner plates and broth and bile-broth), and in all cases the results were negative.

In addition, amniotic and allantoic fluid was tested for its anti-bacterial action on cultures of *Bact. coli*, *Staphylococcus pyogenes aureus* and *Streptococcus pyogenes*. The growth of *Bact. coli* was favoured and that of the other bacteria inhibited.—W. VON DÜRING (BERLIN).

BUCHANAN, R. E. (1932). **The Present Status of Bacterial Nomenclature.**—[Paper presented at 34th Ann. Meet. Soc. Amer. Bact., Ann Arbor, Michigan, 28th, 29th and 30th Dec., 1932]. [Copied verbatim from *J. Bact.* **25.** 41].

A consideration of the status of international agreements, of the policies of the International Committee, and of recent advances in systematic bacteriology. It is concluded as a result of the analysis that even the more radical views of pleomorphism, complex life histories, etc., will have only minor effect upon nomenclature and should not materially retard our stabilization of names.

DISEASES CAUSED BY PROTOZOAN PARASITES.

I. YAKIMOFF, W. L., GOUSSEFF, W. F., & MATIKASCHWILI, I. L. (1932). Ueber Coccidien des Pfaues. [**On Coccidia of Peacocks**].—*Zschr. Parasitenk.* **4.** 748-752. 6 tables. [7 refs.]

II. KNORPP. (1933). Medikamentöse Behandlung der Kokzidiose der Küken. [**Medicinal Treatment of Fowl Coccidiosis**].—*Stuttgart. tierärztl. Mschr.* **4.** 13-14.

I. This article records the detection of coccidia in peacocks in the zoological gardens of Taschkent (Turkestan) and Leningrad. Two types were encountered which the authors consider correspond to *Eimeria tenella* and *E. mitis*.

II. Knorpp records the treatment of three outbreaks of coccidiosis in fowls with Kerr's iodized milk. There was little reduction in the death rate for five to six days after commencing treatment, but after that period a striking decrease in disease occurred. It was considered that the treatment had little effect once intestinal alterations had occurred, but that it was certainly effective in preventing further infection [see also this *Bull.* **3.** 438.—Ed.]—U. F. RICHARDSON.

YAKIMOFF, W. L., MATIKASCHWILI, I. L., & LEWKOWITSCH, E. N. (1933). Zur Frage der Nuttallia equi. [**On the Subject of** *Nuttallia equi*].—*Berl. tierärztl. Wschr.* **49.** 257-260. 2 figs., 1 table. [10 refs.]

The authors record the occurrence in Russia of 2 forms of *Nuttallia* [= *Babesia*] *equi*. In one type, large forms of the organisms were encountered with rings up to 2·25μ in diameter, in addition to small forms with rings 0·8μ in diameter. The second type showed the small forms only and was encountered in cases of

meningitis in horses. It is suggested that this small type may be a relapse form whose appearance is provoked by the accompanying primary meningitis.

The question of the identity of the *Babesia* parasites of horses and asses is discussed and it is recorded that a naturally infected ass failed to react to an inoculation with the equine parasite. This is claimed as proof of the identity of the two parasites.

Treatment of the disease in horses is discussed and, in ten cases, recovery followed the use of ichthargan after treatment with trypan blue had failed.

—U. F. RICHARDSON.

LESTOQUARD, F., & SAVANCE, P. (1933). Existence de *Theileria recondita* en France. [**The Existence of** *Theileria recondita* **in France**].—*Bull. Soc. Path. exot.* **26.** 438-439. [1 ref.]

This article records the detection of a theileria infection of sheep in the Eastern Pyrenees. 1% of the red blood corpuscles were parasitized. The sheep were also infected with *Babesia ovis*.—U. F. RICHARDSON.

MANNUCCI, E. (1932). Infezione da *Theileria parva* e da *Theileria annulata* anche nei bovini del piano del Lago di Chiusi. [*Theileria parva* **and** *Th. annulata* **Infection in Bovines on the Plain of Lake Chiusi**].—*Clin. Vet. Milan.* **55.** 884-889. 5 figs. on 1 plate. [3 refs.]

During recent years, the author has observed in the spring and summer several cases of disease in cattle with symptoms and lesions of an acute infective nature. A brief report is given of two typical cases of infection in a calf and in a heifer respectively. The symptoms and lesions of a mixed infection of *Th. parva* and *Th. annulata* are also described ; these were haemoglobinuria, tumor splenis and haemorrhagic infarcts.

The parasites were demonstrated in the blood and spleen pulp and Koch's bodies in the white corpuscles.—F. VEGLIA (TURIN).

I. MARCHOUX, E., LEROY, R., & CHORINE, V. (1933). Essais infructueux de filtration du paludisme. [**Unsuccessful Attempts at the Filtration of Malaria**].—*Bull. Soc. Path. exot.* **26.** 260-266. [1 ref.]

II. SERGENT, E., & CATANEI, A. (1933). Essais de filtration du virus du paludisme des oiseaux (*Plasmodium relictum*). [**Attempts to Filter the Virus of Bird Malaria** (*Plasmodium relictum*)].—*Ibid.* 267-268. [1 ref.]

III. BROWN, H. C. (1933). **Preliminary Observations on Electric Charge of the Erythrocytes in Bird Malaria.**—*Trans. Roy. Soc. Trop. Med. & Hyg. London.* **26.** 515-522. 5 tables. [6 refs.]

I. This paper records negative results obtained from inoculating filtrates of cerebrospinal fluid and blood of malarial cases into human volunteers. As it might be suggested that *Chromobact. prodigiosum*, used to control the filtration, might injure the malarial virus, the method of centrifuging was also used. One positive result was obtained from a *Plasmodium falciparum* infection from supernatant fluid after a speed of 3,000 to 4,000 R.P.M. for 5 minutes had been employed, but after speeds of 9,000 R.P.M. no infection occurred.

II. Negative results were recorded in 14 canaries after inoculation with blood infected by *Pl. relictum* filtered through Chamberland filters L_1, L_2, and L_3. The canaries were afterwards proved susceptible by inoculating unfiltered blood.

III. This records observations on the electrical charge of the red cells in bird malaria. Ten observations were made on each infected canary and compared with the mean of 10 observations in 2 normal canaries. It is admitted that a far

greater number of observations would be desirable, but it is thought that the results are sufficiently definite to be of interest. Daily observations were undertaken in 20 infected birds and 21 normal birds and there has been no exception to the indication that the electric charge of the red cell varies inversely with the parasite rate in the peripheral blood. It appears that reduction of charge in the red cells of an infected bird is an important factor in the extent to which phagocytosis takes place.—U. F. RICHARDSON.

SOETISNO, M. (1933). Surra bij een tapir (tapirus indicus). **[Surra in a Tapir (*Tapirus indicus*)].**—*Ned.-Indisch. Blad. Diergeneesk.* **45.** 126-128. [Summaries in English, French and German : abst. from orig.]

Tryp. evansi was found in the blood of a tapir which had been captured two months previously and placed with a fawn in the Zoo at Fort de Rock, Dutch East Indies. The animal was acutely ill, and at *post-mortem* examination the intestines were found to be inflamed over their whole length. The fawn was given intravenous treatment with 250 mg. naganol, but its blood test was negative.
—A. KLARENBEEK (UTRECHT).

DUKE, H. L. (1933). **The Domestic Fowl of Uganda as a Host for Trypanosomes of the *Brucei* Group.**—*Parasitology.* **25.** 171-191. 2 tables. [22 refs.]

This article discusses previous work on the susceptibility of fowls to infection with polymorphic trypanosomes and records experiments undertaken to ascertain the importance of the fowl as a host of these trypanosomes in connection with investigations on tsetse transmission. It was shown that if flies infected by *T. rhodesiense* or *T. brucei* were fed on clean fowls, the blood of the latter could be proved to contain the trypanosomes by subinoculation into rabbits or monkeys. Also, if clean flies were fed on infected fowls, a light infection resulted in a small number of flies. In view of the light infections encountered, it is suggested that the fowl has an inhibitory influence on the further development of the trypanosomes in tsetse.—U. F. RICHARDSON.

DUKE, H. L. (1933). **Studies on the Factors that may Influence the Transmission of the Polymorphic Trypanosomes by Tsetse. I. A Review of Existing Knowledge on this Subject, with some General Observations. II. On the Transmitting Power of Different Races of *Glossina*. III. *Glossina morsitans versus Glossina palpalis* as a Transmitter of the Polymorphic Group of Trypanosomes.**—*Ann. Trop. Med. & Parasitol.* **27.** 99-118, 119-121 and 123-130. 5 tables. [24 refs.]

These papers discuss the problem of the imperfection of the adaptation of African trypanosomes to the tsetse on which they depend for their survival. The first paper gives a general review of the results obtained by different authors by dissection of game tsetse and gives a conception of the degree of adaptation between trypanosome and fly under natural and laboratory conditions.

T. vivax and its allies which infect the proboscis only are always the most widely distributed in wild tsetse and the polymorphic group is the least successful in this respect. Excluding certain high percentages of infection recorded when only small numbers of flies have been under observation, laboratory results rarely exceed a 20 per cent. infection with polymorphic trypanosomes. In nature, the food animals of the tsetse may influence the type of infection and the percentage of flies infected. Attention is drawn to the records of double infections of a single tsetse and to the possibility that only a certain limited number of individual flies are able to act as hosts for trypanosomes. It is suggested that flies harbouring

T. grayi may represent receptive individuals which have been feeding on reptilian hosts in place of mammalian hosts.

There are indications that, in certain circumstances, *G. pallidipes* may attain a relatively high standard of efficiency as a carrier. Whether this is determined by climate or racial peculiarities is uncertain, but the indications in favour of climate being an important factor in determining infection rate are not at all clear.

Unilateral infection of the salivary glands has been shown to occur in both *G. morsitans* and *G. palpalis*, and the infection of *G. morsitans* with *T. grayi* is recorded.

The second paper discusses the hereditary immunity of tsetse flies to trypanosome infection and records the results of dissections of descendants of Damba Island flies which have been in contact with polymorphic trypanosomes for many generations and of *G. palpalis* collected near Entebbe which, in recent years, have fed mainly on hippopotamus and crocodile. The receptivity of the two groups showed little difference.

The third paper concludes, from the records of KLEINE and FISCHER, and from those of the Entebbe laboratory, that *G. morsitans* is a more efficient vector of the trypanosomes of the polymorphic group than *G. palpalis*. A note is given of a strain of *T. gambiense* which produced gut infection, but no infection of the salivary glands, either in *G. palpalis* or in *G. morsitans*.—U. F. RICHARDSON.

LWOFF, A. (1933). La fonction du sang dans les cultures des Trypanosomides. [**The Function of Blood in Cultures of Trypanosomides**].—*C. R. Soc. Biol. Paris.* **113.** 231-234. 1 chart. [4 refs.]

This article records experiments on the oxygen metabolism of cultures of *Strigomonas fasciculata* in various blood concentrations and concludes that the failure to multiply in the absence of blood is due to a deficiency in the respiratory catalytic system of the organism. The addition of blood to the medium leads to a greater consumption of oxygen and increased multiplication. Such substances as haematin, protohaematin and protoporphyrin provoke an increase of respiration, but the flagellate is incapable of making the synthesis of protoporphyrin and such substances as haemotoporphyrin are therefore inactive.—U. F. RICHARDSON.

HEWITT, J. A. (1933). **Sarcosporidiasis in Human Cardiac Muscle.**—*J. Path. & Bact.* **36.** 133-139. 4 figs. on 2 plates, 2 tables. [17 refs.]

This article records the finding of sarcocysts in the cardiac muscle of a young woman who had died as the result of an accident. The cysts averaged 0·19 mm. long by 0·05 mm. in diameter and were markedly uniform. The spores were semicircular or banana-shaped and averaged 5μ by 2μ; they showed extra-nuclear granules. The size of the spores and their curvature, which was greater than that of any previously described sarcosporidia, may separate this species from any previously recorded, and also from the sarcocysts of the lower animals.

A discussion is given of sarcosporidiasis of sheep and particularly of the possibility of infection being conveyed by milk. It is said that guinea pigs and mice can be infected by contaminated milk.—U. F. RICHARDSON.

DISEASES CAUSED BY VIRUSES.

NIESCHULZ, O. (1933). Ueber Infektionen von Ratten mit Pferdesterbevirus. [**Experiments on Infection of Rats with the Virus of South African Horse Sickness**].—*Zschr. Infektkr. Haust.* **43.** 257-260. [1 ref.]

The author succeeded in infecting mice with the virus by intracerebral inoculation. An infection with a mortality of 100% was obtained after a few generations. The virus was maintained for 23 passages by regular intracerebral inoculation of brain tissue. The experimental animals of the 5th to 10th passage died in the earlier passages after 9 days and in the latter passages after 5 to 7 days, showing symptoms of paralysis. The virus became completely neurotropic in mice, which is contrary to what occurs in horses ; it could not be found in blood or in tissues and could only be transmitted in mice by intracerebral inoculation.

Attempts to infect rats in the same manner failed. Rats are not suitable experimental animals in this disease.

A description of the mode of infection and the details of experiments are given.—F. W. Müller (Berlin).

I. Remlinger, P., & Bailly, J. (1933). La maladie d'Aujeszky et le Porc. **[Susceptibility of the Pig to Aujeszky's Disease]**.—*Bull. Acad. vét. France.* **6.** 169-179. [6 refs.]

II. Remlinger, P., & Bailly, J. (1933). Transmission de la Maladie d'Aujeszky au porcelet. **[Transmission of Aujeszky's Disease to Young Pigs]**.—*C. R. Soc. Biol. Paris.* **113.** 36-37.

I. The authors give details of experiments that proved the susceptibility of young pigs to the virus of Aujeszky's disease. The possibility of the disease being introduced with prophylactic sera is discussed. It appears to be an unlikely possibility, particularly as the pure serum from affected animals is avirulent.

II. Young pigs were proved to be susceptible to both the Brazilian and the Hungarian strain of the virus of Aujeszky's disease.—T. M. Doyle.

Donatien, A., & Lestoquard, F. (1933). Contrôle de l'immunité anticlaveleuse par intradermo-réaction. **[The Control of Immunity to Sheep Pox by an Intradermal Reaction]**.—*C. R. Soc. Biol. Paris.* **112.** 573-574. [1 ref.]

The authors have prepared a sheep pox antigen by mixing equal parts of an emulsion of sheep pox crusts with glycerine and heating to 60°C. for one hour. [An antigen of a similar composition was elaborated by Durand & Conseil from variolous and vaccinal crusts for the diagnosis of the state of immunity in these diseases—see this *Bull.* **3.** 306].

The inoculation of 0·2 c.c. into the caudal fold is without effect in susceptible animals or during the early stages of infection, while in vaccinated sheep an oedematous swelling, which may persist for several days, is observed. It is evident that the reaction is closely related to the degree of immunity and can be used to control the protection induced by various methods of vaccination.—R. E. Glover.

Bedson, S. P. (1933). **Immunological Studies with the Virus of Psittacosis.**—*Brit. J. Exp. Path.* **14.** 162-170. 8 tables. [8 refs.]

An attempt was made to produce a hyperimmune psittacosis serum in the guinea pig by the intraperitoneal injection of a virulent splenic emulsion. Serum-virus tests on the guinea pig skin showed definite neutralizing antibodies, although the value of the serum in protecting mice was of a low order. Complement-fixing antibodies were demonstrated in this serum and they increased in value during the course of immunization. There was also definite fixation with recovered human sera, but this reaction weakened as convalescence proceeded. In addition, caution was necessary in interpreting these results, as a Wassermann positive serum fixed complement in the presence of psittacosis virus.

Continuing his investigations on the immunizing value of formalinized virus

[see this *Bull.* **2.** 150.], it was shown that virulent mouse spleen inactivated by formalin or formalin accompanied by steaming can induce some degree of immunity in the mouse. [It would appear from the tables that this was not very solid].

—R. E. Glover.

Moltke, O. (1932). **The Infectiousness of Psittacosis.**—*Brit. Med. J.* April 9th. 65.

In 1930 a vessel arrived in Denmark carrying some parrots from Brazil. Five persons from this ship were admitted to hospital affected with psittacosis. A *post-mortem* examination was carried out on one of the parrots by a doctor, in the presence of 3 other doctors, all of whom were associated with the cases of disease in the human beings.

The 4 doctors developed psittacosis and it is suggested that the incubation period is about 9 days.—Norman Dobson.

I. Levaditi, C., Ravaut, P., Vaisman, A., & Schoen, R. (1933). Réceptivité du Chat à l'égard du virus lymphogranulomateux. Neuro-infection auto-stérilisable. **[Transmission of the Virus of Lymphogranuloma Inguinale to the Cat. Autosterilization of the Nervous System].**—*C. R. Soc. Biol. Paris.* **112.** 48-50. [9 refs.]

II. Levaditi, C., Ravaut, P., & Levaditi, J. (1933). Essais d'adaptation du virus lymphogranulomateux (maladie du Nicolas et Favre) au testicule et au névraxe du Lapin. **[An Attempt to establish the Virus of Lymphogranuloma Inguinale (Nicolas and Favre Disease) in the Testicle and Nervous System of the Rabbit].**—*Ibid.* 1672-1674.

I. The intracranial inoculation of the young cat with a monkey strain of the virus of lymphogranuloma determines a lymphomatous meningo-encephalitis [see this *Bull.* **3.** 306]. The virus was transmitted from cat to cat by the same route up to the 4th passage experiment, but the brain from this animal proved to be non-infective. It is suggested that, as in the case of other neurotropic viruses (herpes, rabies, etc.), the disappearance of the virus is due to autosterilization of the nervous system.

II. In this article a description is given of experiments in the rabbit. The virus, obtained from the brain of an infected monkey, was inoculated into the testicles of rabbits. An interstitial orchitis was set up between the 3rd and 12th days during which period the virus was recoverable by the intracerebral injection of monkeys or mice. It was not possible, however, to secure serial transmissions through the testicle or to induce an encephalitis in rabbits with testicular material.

—R. E. Glover.

Evans, Alice C. (1933). **Inactivation of Antistreptococcus Bacteriophage by Animal Fluids.**—*Publ. Health Rep. Washington.* **48.** 411-426. 6 tables. [30 refs.]

From a review of the literature it is concluded that bacteriophage has in nearly all cases failed to influence the course of experimental disease. The experiments recorded in this paper are concerned with the therapeutic action of a single race of streptococcus bacteriophage in experimentally infected animals, and its lytic action in the presence of animal fluids and cells *in vitro.*

Antistreptococcus 'phage did not palliate an infection of mice with one minimum lethal dose of sensitive culture, whether the 'phage was injected at the same time as the infecting dose of culture, or incubated with it previously. There was some evidence that 'phage may activate a sublethal dose. Antistreptococcus

'phage given intravenously to rabbits simultaneously with, or three days before, the injection of a slightly sublethal dose of streptococci failed to influence the mortality rate. There was some evidence that the disease in 'phage-treated rabbits was unusually severe.

Bacteriophage could be demonstrated in the blood of a rabbit two but not three days after intravenous injection ; it was then still demonstrable in the spleen but not in the liver.

In vitro, bacteriophagy was completely inhibited by blood, pus, ascitic fluid, bile and saliva. It was partially inhibited by urine. The fluid portion of blood and of pus contains the inhibitory constituent, the washed whole cells being almost or quite inert. In addition to the definite inactivation of 'phage by undiluted or slightly diluted body fluids, there was some evidence of an irregular inhibition in higher dilutions.—A. W. STABLEFORTH.

DISEASES CAUSED BY METAZOAN PARASITES.

HASSALL, A., & POTTER, Margie. (1932). **Index-Catalogue of Medical and Veterinary Zoology. Part I. Authors AALL to AZZOLINA.** pp. 142. Washington, D.C. : United States Department of Agriculture. Government Printing Office.

As stated in the foreword, this catalogue is a revision and continuation of the *Index-Catalogue of Medical and Veterinary Zoology—Authors*, published in 1902-1912 under the authorship of STILES and HASSALL. For administrative reasons, the various parts of the catalogue are being continued under different authors, the host catalogue from the National Institute of Health and the author catalogue from the Bureau of Animal Industry. Owing to the great demand for the former author catalogue, which has long been out of print, it is being incorporated in the present publication.

Although the work is one of the most complete of its kind the authors are careful to point out that they make no claim to completeness, but simply present it as a working index, more comprehensive as to parasitic helminths than to protozoa, poisonous and parasitic arthropods and poisonous snakes. It is to be published in a series of parts continuing through the alphabet, each part to be of some 100 pages.

No further comment need be made than that the first part of the revised edition appears in every way to equal the very high standard attained in the preceding edition of this invaluable work.—E. L. TAYLOR.

WILSON, F. H. (1933). **A Louse Feeding on the Blood of its Host [Fowl].**—*Science*. **77.** 490.

It has frequently been denied that Mallophaga actively remove blood from their hosts. The author records that he has found blood in the alimentary tract of individuals of *Menopon stramineum* Nitzsch on fowls. On one occasion an individual was found with its mandibles deeply sunk in the quill of a young feather from which the dermal papilla, bearing blood vessels, had not been withdrawn. On removal of the louse, blood flowed from the wound. Examination of the quill showed many scars of the same type of wound as the one from which the louse had been removed. It is suggested that this type of feeding may be normal.

—J. S. STEWARD.

BISHOPP, F. C. (1933). **Mosquitoes Kill Live Stock.**—*Science*. **77.** 115-116.

An outbreak of deaths due to attacks of *Psorophora columbiae* Dyar and Knab resulted in the death of at least 173 head of livestock and poultry. The outbreak commenced suddenly on the night of September 5th and continued for several days. The losses were most severe the first night, many animals being found dead or nearly so in the morning. Death was believed to be due to the injection of a toxin as well as to loss of blood. No mosquitoes were found in the air passages. Cattle with access to the canal immersed themselves to the head and suffered little.

P. columbiae lays its eggs on the soil and they hatch quickly when submerged. Great swarms of adults therefore emerge simultaneously when egg-bearing areas are flooded. This species is usually not important as a pest of human beings, but the men looking after the stock had to wear heavy coats and blankets for protection and some were sick for several days from the bites of the mosquitoes.

—J. S. STEWARD.

COUSI, D. (1932). La cysticercose bovine en Tunisie. Applications à l'inspection des viandes. [**Bovine Cysticercosis in Tunis. Applications to Meat Inspection**]. pp. 94. 2 figs., 2 plates, 4 tables. [182 refs.] Toulouse: Lion et Fils. [8vo].

COUSI, D. (1933). La cysticercose bovine en Tunisie. [**Bovine Cysticercosis in Tunis**].—*Rev. vét. et J. Méd. vét.* **85.** 121-130. 2 figs., 4 tables.

The 2nd publication gives an abridged account of the contents of the author's thesis. In the author's opinion it is not possible to diagnose the condition in the living animal, but systematic *post-mortem* examination allows very few infected carcasses to escape unnoticed. He finds the heart to be the chief site of infection, the masseter muscles the second in order of frequency, the tongue the third and the pillars of the diaphragm the fourth.—E. L. TAYLOR.

WETZEL, R. (1933?). Die häufigsten parasitischen Würmer unserer Haustiere. [**The Most Common Parasitic Worms of our Domestic Animals**]. Hanover: F. Eberlein. Leaflet of 16 pages. [8vo].

An undated check list of the commonest parasitic worms of equines (horse, ass), ruminants (ox, sheep, goat), swine, carnivores (dog, silver fox, cat), and poultry (fowl, pigeon, goose and duck).

The matter is arranged in sections according to host and the worms are arranged in a uniform order, their names, synonyms, hosts, sites and life cycles being given as briefly as possible.

The leaflet is thus useful for reference purposes.—J. E.

HULPHERS, G. (1933). De hos pälsdjuren vanligast förekommande inälvsparasiterna. [**The Intestinal Parasites occurring in Fur-Bearing Animals**].—*Skand. Vet.-tidskr.* **23.** 133-154. 16 figs. [2 refs.] [Summary in English: abst. from orig.]

Coccidiosis caused by *Eimeria stiedae* is seen chiefly in rabbits, but also in nutria. It is seldom seen in foxes, but *Isospora bigemina* infection is not uncommon in the dog and cat. The life history of the coccidium is similar in all animals. Cure of the disease is not recommended. Clinical symptoms alone are not diagnostic and diagnosis should always be confirmed by microscopic examination of the faeces. Wherever possible, clean and dry ground should be given and faeces collected.

Ascaridia have been found in carnivores and when present in large numbers have caused severe illness and death. Those chiefly found have been *Toxocara*

canis, *Toxocara cati*, and *Toxocaris leonina*. The egg is ingested and hatches out in the small bowel. The free larva finds its way through the bowel wall to the blood stream, by which it reaches the lungs. After developing for a time in the lungs it is coughed up to the throat and is again swallowed, to reach maturity in the small bowel. All ascarids do not come direct from the lungs, some may again pass into the blood stream and thus they may occasionally be found in the heart and kidneys, in the foetus and in new-born animals. During recent observations, ascarids have been found engorged with blood and the small wounds left by them in the mucous membrane of the bowel are often invaded by bacteria. The nervous symptoms and anaemia seen in cases of heavy infestation are due to the poisonous secretions of these worms and it seems that those secretions are set free by the decomposition of dead worms. Symptoms of ascariasis are not characteristic and diagnosis can only be confirmed by the finding of mature worms or their eggs in the faeces of the host. Care must be taken with the general hygiene and the cages well scalded with boiling water. Owing to the thickness of the egg capsule, it is doubtful if the ordinary chemical disinfectants are of any use. Tetrachlorethylene has been used as a vermifuge with good results.

Hookworms, *Ancylostoma caninum* and *Uncinaria stenophilia*, have been found in foxes. The author draws attention to dogs as being the chief source of infestation.

Whipworms, *Trichuris vulpis*, have been found in foxes and similar worms of the Trichuris family in nutria.

Two types of lungworms have been found in foxes, *Crenosoma vulpis* and *Eucoleus aerophilus*, which when present in large numbers cause considerable trouble and even death.

Tapeworms are not common in foxes, but in nutria *Hymenolepis otocoronata* is found in the small bowel. This is about 20 cm. long and has flat, short segments about 2 or 3 mm. broad. The intermediate host is unknown. Eggs may be found free in the faeces or in the segments ; they are round or slightly oval with a thick shell and contain a granular substance with three pairs of small embryonic hooks.

In foxes, a trematode, *Pseudamphistosum truncatum*, has been found in the liver. The parasite is 2 mm. long and conical in shape with a square cut base ; the ventral sucker is placed about the middle of the body. The eggs are oval. In nutria the large liver fluke, *Fasciola hepatica*, is commonly found in the bile ducts of the liver. Care must be taken to keep these animals away from water which may carry the intermediate host. Good results have followed dosing, both with distol and igitol.

Flotation methods have been used almost exclusively for the examination of faeces in the hygienic department of the Stockholm Veterinary College, where these observations have been made. Either concentrated salt, sugar, or glycerine solutions have given the best results.—A. A. Forsyth.

Lührs, E. (1933). Bekämpfung der Leberegel- und Lungenwurmseuche in den an die See grenzenden Gebieten. **[The Control of Liver Fluke and Lungworm Disease in Districts bordering on the Sea Coast].**—*Arch. wiss. prakt. Tierhlk.* **66.** 15-31, 149-153, 154-159, 160-162 and 163-167. 2 tables. [33 refs.]

From time to time the province of Oldenburg has suffered heavily from liver fluke and lungworm infestation in sheep and cattle and it is estimated that the average loss per sheep and ox per year is as much as 11 RM. In the worst years this rises to 23·90 RM., and in 1927 to 1928 and 1928 to 1929 the total loss from liver rot was estimated to be 8,000,000 RM. Control by male fern extract, though

fairly successful, is expensive, costing 10·5 RM. per ox and 2 RM. per sheep per year and it seems very desirable that the possibilities of controlling the disease by cheaper methods should be fully explored. The author experimented with a number of substances for the destruction of infective material on the ground and found that sea water had a marked lethal effect ; the eggs of the liver fluke were destroyed in 16 days, the miracidia in 45 seconds, cercariae in 7 minutes, the intermediate host, *Limnaea truncatula*, in 24 hours and various slugs (the intermediate hosts of some lungworms) in 1½ hours. A careful investigation was therefore made into the practicability of applying this method to areas which have been reclaimed from the sea and where periodic flooding with sea water could be effected. Careful enquiry was made into the effect of sea water upon the land and upon the stock which afterwards graze the flooded pasture. Although arable land suffers very severely and should never be flooded, inundation of pastures for a short time causes no harm, and provided the cattle which subsequently graze there are supplied with fresh drinking water, they will not suffer in any way. The author also made field observations and carried out experiments on a small scale to ascertain how far the infective material was destroyed under field conditions and concluded that, where it can be employed, the periodic flooding with sea water has great possibilities for the control of liver flukes and lungworms.

—E. L. Taylor.

IMMUNITY.

Burghardt. (1933). Blutgruppen beim Pferde. [**Blood Groups in Horses**].—*Zschr. Veterinärk.* **45.** 33-52. 15 tables. [10 refs.]

A study was made of the blood of 150 army horses of various breeds and colours, 4,884 cross tests being made. Using sera which had been concentrated to one-third their volume by the method previously described by Lührs (repeated freezing and centrifugation to obtain the lower yellow layer of supernatant), it was possible, by comparison with several known bloods, to arrange all of these into groups similar to those found amongst human beings. In order to obtain reliable results it was found necessary to use sera which were 7 to 15 days old, and blood cells which were at least 1 day and not more than 8 days old. The number of positive results obtained was 11% greater than that obtained by earlier workers, a result which is attributed to the use of the concentration method.

Of the 150 bloods, 5·33% were placed in group O, 18·67% in group A, 11·33% in group B, and 64·67% in group AB.

No significant correlation could be found with either breed or colour. The composition of the material examined was too varied to make a study of hereditary effects possible.

Regarding resistance to disease, the authors consider that further work is necessary, but note that resistance appeared to be greatest in group A, and then in AB, O and B in that order.—A. W. Stableforth.

I. Gaggermeier, G. (1932). Vergleichende Untersuchungen über allergische und serodiagnostische Methoden zum Nachweis der Rindertuberkulose. [**Experiments on Allergic and Sero-Diagnostic Methods for the Detection of Bovine Tuberculosis**].—*Zschr. Infektkr. Haust.* **41.** 202-240. 8 tables. [107 refs.]

II. Gaggermeier. (1932). Gestattet die Tuberkulinprobe einen Ruckschluss auf die Ausbreitung der Tuberkulose ? [**Does the Tuberculin Test give any**

Indication of the Extent of Tuberculosis?]—*Berl. tierärztl. Wschr.* **48.** 261-262. 2 tables. [10 refs.]

I. A comparison was made of the diagnostic value of the intradermal tuberculin and the complement-fixation tests for the diagnosis of tuberculosis in 155 cattle found on *post-mortem* examination to be affected with the disease in various degrees.

The intradermal test applied in the skin of the neck and in the caudal fold detected 87 and 71% respectively of the animals infected, while 56% gave positive results to the complement-fixation test. It appeared that skin allergy and complement-fixing antibodies were not developed concurrently in the infected animal, since the former reaction usually denoted the primary stage of infection, whereas the complement-fixation test gave the maximum positive results when the disease was of longer duration.

No macroscopic lesions were found in 24 cattle which reacted to one or other of the tests and, to account for this, the author suggests the possibility of infection with tubercle bacilli of the human or avian type.

Two herds, consisting of 65 and 82 cattle respectively, were examined as before, and also by two further tests, the ophthalmic test and by the bacteriological examination of tracheal mucus using a special canula. Tubercle bacilli were found in the mucus of about 50% of the cattle while the intradermal skin test was positive in 95% of cases and the caudal fold test in about 70%.

Comparing the individual tests, the author states that the skin intradermal method gives the most favourable results and can be conveniently augmented by the ophthalmic test using the diagnostic agent in the form of discs inserted into the conjunctival sac.

II. A thorough *post-mortem* examination was conducted on bovine animals reacting to the intradermal test in various degrees in order to ascertain the relationship between degree of reaction and extent of tuberculosis in the body. The investigations showed that the stronger the tuberculin reaction, the greater the probability of recent infection due either to primary or to re-infection and that the strength of reaction was in no way dependent upon the degree of dissemination of the disease.—S. J. Edwards.

Stenius, R. (1933). Om Tuberkulinreaktioner hos nötkreatur framkallade av human infektion. [**Tuberculin Reactions in Cattle due to the Human Type of Infection**]. pp. 32. 7 tables. Helsingfors: A. B. F. Tilgmanns Tryckeri. [Paper presented at 4th Nordiska Veterinarmötet, Helsingfors, Finland]. [Summary in English: abst. from orig. in Swedish].

Finnish statistics covering the last ten years show that about 0·1% of all cattle killed for food purposes were tuberculous, whilst tuberculin tests gave the corresponding figures of 2 to 3% [see this *Bull.* **3.** 509]. This discrepancy clearly required investigation and this article presents the results of up-to-date work on the problem.

In recent years the intradermal tuberculin test has been employed in the eradication of bovine tuberculosis in Finland and as a result of positive reactions, animals were frequently killed, but showed no tuberculous lesions at autopsy.

More intensive investigations were made on several farms and it was found that positive tuberculin reactions, usually weakly positive, were frequently obtained from cattle belonging to persons affected with open tuberculosis. Much evidence on this matter has been collected and is given in the text and in large tables. In a few cases human type tubercle bacilli have been isolated from cattle, but usually the only indication of infection was the intradermal tuberculin test reaction, which

was much more sensitive than the subcutaneous test. The reactions occur a few months after exposure to infection and may not disappear until some three years after the cessation of exposure.

The author shows from the evidence collected that positive reactions in cattle, chiefly in calves raised on the farm, may be due to the human type of infection contracted from their keeper.—J. E.

BARRETT, E. P. (1933). **Notes on the Intradermal Tuberculin Test in Swine.**—*Vet. Rec.* **13.** 811.

The author describes his experience with the single intradermal tuberculin test for swine. Owing to incessant fidgeting, the ear site was abandoned after a few trials and the loose fold of skin at the flank used with practical advantage.

A table shows the changes in skin thickness observed in testing one boar and 19 sows. It was found that the 48th hour and not the 24th hour was more suitable for taking measurements.

Tuberculin from the Institute of Animal Pathology, Cambridge, was used in a dose of 0·1 c.c. [It has not been possible to confirm the test results by autopsy, so the author's interpretation of the results can only be taken as conjectural].—J. E.

I. CUMMINS, S. L., & EVANS, A. C. (1933). **The Intradermal Tuberculin Test in Non-Tuberculous Adults.**—*Brit. Med. J.* May 13th. 815-817. 7 tables.

II. LLOYD, W. E., & MACPHERSON, A. Margaret C. (1933). **A Reinvestigation of Children Previously Examined by Tuberculin Tests.**—*Ibid.* 818-820. 5 tables.

I. Continuing their investigations into cutaneous tuberculin sensitivity [see this *Bull.* **3.** 400.], the authors applied the intradermal test to a colony of adults in a mental hospital. Marked individual variations were noted both in regard to the end-points of the titrations (falling dilutions of 1 : 10 to 1 : 100,000 were employed) and to the intensity of the reactions (size of the weals). The relation of these responses to the activity of the disease is discussed.

II. A group of children, previously tested by dermal methods, were retested one to 1½ years later by the Mantoux test, to determine whether sensitivity to tuberculin was retained or lost by comparing the lowest concentration to which they reacted on the two occasions. The results obtained in 700 children, of ages varying from 1 to 15 years, showed that allergy, once it is produced, persists throughout childhood in over 96 per cent. of cases.—R. E. GLOVER.

WHITE, P. Bruce. (1933). **Observations on *Salmonella* Agglutination and Related Phenomena. (iv) The *p*-variant and an antigen soluble in acidified 75 per cent. alcohol.**—*J. Path. & Bact.* **36.** 65-76. 2 tables. [5 refs.]

The author has previously referred to certain salmonella variants which, while exhibiting the cultural and physical peculiarities associated with roughness, differ from the ordinary R form in somatic serology. These aberrant races were named *p* forms. It is probable that subsequent knowledge will show that these salmonella races fit into some general scheme of bacterial variation and change. Both R and *p* forms are loss variants of the smooth S form. Whereas in the R form a factor which is masked in the S form rises to dominance on disappearance of the S antigen, in the *p* form a pair of factors present but inconspicuous in the R form dominate the somatic serology, supplanting the vanished R antigen. Only in disruption of the bacillus are these masked elements disclosed. A description of the serological behaviour of *p* variants of *Bact. typhosum*, *Bact. enteritidis* and

Bact. aertrycke are given and it is shown that these three variants are identical in somatic agglutinating and agglutinin binding properties. These special serological properties depend upon the presence of carbohydrate haptenes. Whilst R bacilli contain apparently in their deeper substance a certain amount of the *p* haptene, *p* bacilli are practically devoid of the characteristic R haptene. It is therefore concluded that the *p* form is a loss variant of the R form.

Further work has been done on the properties of various protein fractions extracted from salmonella bacilli. A previous communication dealt with the Q protein, a somewhat superficial constituent of the bacillus, whilst the present paper deals with a protein antigen T which, although more deeply seated in the bacillus than Q, may be readily exposed in R and *p* forms. This protein antigen (T) is extracted from salmonella bacilli by acid 75 per cent. alcohol, and it appears to be common to the salmonella group. Its antiserum will agglutinate alcohol-washed or autolysed R and *p* bacilli, but fails to agglutinate alcohol-washed S bacilli or young living cultures.

In all this work an important point is that the antiserum of a bacillus is overwhelmingly the antiserum of the surface rather than of the substance, and by long growth or by various treatment further surfaces of the bacteria may be exposed.
—R. Lovell.

Shwartzman, G. (1933). **Phenomenon of Local Skin Reactivity to Bacterial Filtrates in its Relation to Bacterial Hypersensitiveness.**—*J. Exp. Med.* **57.** 859-869. 3 figs. on 1 plate, 3 tables. [8 refs.]

It is shown in rabbits that the intravascular interaction of bacterial (pneumococcus type IV) and animal protein (horse serum) antigens, with their homologous antibodies at the site of a tissue made vulnerable by bacterial filtrates, induces prompt and severe haemorrhagic necrosis in that tissue. The mechanism underlying focal and skin bacterial hypersensitiveness is discussed in the light of these findings.—A. W. Stablefort.

Dubois, C. (1933). Essai de nouveaux antigènes pour le diagnostic de la mélitococcie ovine par la recherche des réactions d'allergie. [**Comparison of Formolized with Heat-killed** *Brucella* **Antigens for Use in Allergic Reactions**]. —*C. R. Soc. Biol. Paris.* **113.** 1452-1455. [Summary taken from *Bull. Hyg.* **8.** 769. Signed G. S. Wilson].

In the diagnosis of *melitensis* infection of sheep the author uses the intradermal test for hypersensitiveness. In previous work he has found that a heat-killed suspension of *Br. abortus* is satisfactory. He has now compared this with alcoholized and with formolized suspensions (percentage of formol not stated). Inferior reactions were obtained with the alcoholized suspension, but the formolized suspension gave results that were equal or even superior in intensity to the heat-killed suspension. However, the advantages of killing by heat outweigh, in his opinion, the slightly greater sensitivity of the formolized product, and he therefore proposes to continue the use of the heat-killed antigen.

Todd, E. W. (1933). **The Haemolysin Produced by Streptococci in Serum Media as an Antigen and its Effect on Antistreptolysin** *in vitro*.—*J. Path. & Bact.* **36.** 435-446. 6 tables. [8 refs.]

The author has already shown [see this *Bull.* **3.** 579.] that haemolytic filtrates from streptococcus cultures grown in broth without serum are antigenic, and that the antistreptolysin neutralizes streptolysin produced in serum-free media but not that produced in serum media. He now shows that streptolysin

produced in serum media is also antigenic and that the antibody produced likewise neutralizes serum-free streptolysin, but not the serum-streptolysin in response to which it was formed. Serum-streptolysin and serum-free-streptolysin are equally haemolytic and equally antigenic.

To obtain serum-streptolysin which is resistant to neutralization by anti-streptolysin, it is essential that the normal serum comes into contact with nascent streptolysin ; the combining power of streptolysin formed in the absence of serum is not altered by subsequent addition of normal serum. The failure of anti-streptolysin to neutralize serum-streptolysin is not influenced by the time allowed for neutralization. When haemolytic streptococci are grown in serum-broth containing a large quantity of antistreptolysin, active streptolysin is still formed and does not combine with the antistreptolysin in the medium.

—A. W. Stableforth.

Pelczar, K., & Hofbauer, J. (1933). Influence du facteur de coagulation du sang dans la formation d'anticorps. **[The Influence of Factors Concerned in Blood Coagulation on the Formation of Antibodies].**—*C. R. Soc. Biol. Paris.* **113.** 179-181.

It has been pointed out by previous workers that there exists a connection between the phenomenon of allergy and that of blood coagulation, and in this paper an attempt has been made to determine in what way the formation of antibodies is connected with the presence of agents which influence blood coagulation. For this purpose a series of rabbits were sensitized with suspensions of egg globulins and globulins associated with cephalin and heparin. During the time of sensitization varying amounts of cephalin or heparin were also injected. When the sera were tested for the presence of precipitins, it was found that the simultaneous injection of cephalin in concentrations below 1 : 1,000 increased the rate of precipitation. On the other hand, heparin in concentrations of 1 : 1,000 to 1 : 500 appeared to hinder the formation of precipitins.

To explain these results it is suggested that heparin acts by altering the iso-electric potential of the antibodies, whereas cephalin exerts its action, not only by absorption of the heparin normally present in the body, but also by the transformation of prothrombin into thrombin.—J. A. Nicholson.

DISEASES, GENERAL.

Dimock, W. W., & Edwards, P. R. (1932). **Infections of Fetuses and Foals.**—*Kentucky Agric. Expt. Sta. Bull.* No. 333. pp. 291-339. 3 figs., 6 tables. [21 refs.]

Abortion due to *Bact. abortus equi* is not dealt with in this paper, the authors confining their attention to less well established pathogens.

Abortion.—Haemolytic streptococci were responsible for abortions in 26·5 % of the 325 foetuses examined, though it must be stated that owing to vaccination the percentage due to *Bact. abortus equi* had been reduced to 5·8 %. *Bact. equirulis* (*B. nephritidis equi*) was the cause of only 0·6 %. About 60 % of the seemingly non-infectious abortions which occurred either sporadically or epizootically were due to no assignable cause and an effort is made to correlate their origin with the feeding of hay containing pennyroyal (*Hedeoma pulegoides*) or with a diet containing corn stover (corn straw).

Foal mortality.—*Bact. equirulis* was found to have caused the greatest percentage of deaths (39·8%) amongst the 254 foal cadavers received for examina-

tion ; streptococci (25·6%) and *Bact. coli* and *Corynebact. equi* were only occasionally found. The biology and the pathological conditions caused by these organisms are dealt with at some length. The authors consider that in young foals infection with *Bact. equirulis* is of pre-natal origin, though they did not succeed in reproducing the condition experimentally. They attribute the infection of older foals to the invasion of strongylus larvae which carry the organism with them. The chief reason for this statement is that they have found verminous aneurysms containing the bacteria when they have not been able to demonstrate them in other situations in the body. *Bact. equirulis*, though commonly found in the mouth and pharynx of the normal horse, is not a common inhabitant of the genital tract of mares and it does not show any tendency to become established in this situation, a mare rarely having two foals which die of this infection. On the other hand, streptococci readily invade the genital tract and become established, the result being a series of aborted or diseased foals.—EDWARD F. PECK.

CHAILLOT, L., & SAUNIÉ, L. (1933). La Pathologie ovine dans les États du Levant sous mandat français. [**The Diseases of Sheep in French Mandated Territory in the Levant**].—*Rec. Méd. vét. exot.* **6.** 5-10.

Abortion and mortality in new-born lambs cause heavy losses in the sheep stock. Severe cold, drought and lack of care of the pregnant ewes are the chief causes of these losses.

Anthrax, once common, is now being controlled by vaccination. Blackquarter occurs only to a slight extent. A severe outbreak of haemorrhagic septicaemia occurred in the winter of 1931 to 1932. " Bradsot " is the name given to a disease characterized by lesions in stomach and duodenum, and hypertrophy of the liver, which is friable and dark in colour. The connective tissues contain blood-stained effusions and the muscles often show serous oedema. *Clostridium welchii* is regularly found in liver and bone marrow [not *Vibrion septique* as in the European " bradsot "].

Contagious ecthyma rarely occurs. Foot and mouth disease usually occurs in a mild form. *Theileria ovis* infection occurs : the transmitting tick is not yet known.

Several important parasitic infestations are reported. *Dictyocaulus filaria* and *Synthetocaulus rufescens* may cause high mortality. *Fasciola hepatica* occurs in marshy districts and *Dicrocoelium pancreaticum* is sometimes found on *post-mortem* examination. A species of *Oesophagostomum* causes chronic diarrhoea and anaemia and 20 to 30 per cent. of the affected animals may die. Psoroptic mange is the only type found. *Trichodectes spherocephalus* and *Melophagus ovinus* cause losses, especially in young animals when food is scarce or during severe cold.
—A. BROWNLEE.

STOSS, A. O. (1933). Bösartiges Katarrhalfieber in einem Tierpark. [**Malignant Catarrh in an Animal Park**].—*Münch. tierärztl. Wschr.* **84.** 397-400. [14 refs.]

A description of malignant bovine catarrh in 4 out of a herd of 9 head of cattle of various European breeds. The disease was of the ocular type [see this *Bull.* **1.** 90.] and 3 of the animals died. Sheep appeared to act as transmitting agents. A vaccine prepared from the brain of the first case was inoculated into the other in-contact cattle and only one of them became affected later. The literature on the disease is reviewed.—J. E.

TALBOT, R. J. de C. (1932). **The Sheep Industry. Helpful Hints to Sheep-men. 6. Foot-Rot of sheep.**—*J. Dept. Agric. Victoria.* **30.** 569-573. 10 figs.

Talbot, in the article on " foot-rot " of sheep, gives information on the cause, symptoms and treatment, and details are given of dressings suitable for use where only a few sheep are affected. Where large numbers are affected, foot-baths are recommended and details are given for their construction. After their feet have been trimmed, etc., the sheep are passed through a foot-bath containing a suitable dressing ; good results are reported from the use of a formalin foot-bath (10% solution), after which the feet are allowed to drain and the animals made to stand on air-slaked lime until the hoofs are dry.—J. S. STEWARD.

I. BELLEKENS, A. (1933). Symptômes et lésions observés sur des bêtes bovines electrocutées. **[Symptoms and Lesions observed in Electrocuted Cattle].**—*Ann. Méd. vét.* **78.** 1-7. 2 figs.

II. MASHETER, J. W. H. (1933). **Lightning Stroke.**—*Vet. J.* **89.** 61-62. 1 plate.

I. 15 cattle were housed in a newly-built byre which was provided with electric light and a water supply conveyed by pipes. A high tension cabin in connection with the former was situated 100 m. away. During a thunderstorm 10 beasts were electrocuted of which 2 were killed outright ; 7 had to be destroyed 2 to 4 days later and one recovered after 3 weeks. Of the 8 animals to whom the shock was not immediately fatal, 4 were paralysed in all the limbs and 4 in the hind quarters only. All showed haemorrhage from the vulva and anus. Seven autopsies were performed and revealed that in every animal the bones and musculature of the posterior half of the body had suffered violent damage. The vertebral column was fractured in four cases, the ilium in five, the acetabulum in three and the femur and tibia in one case each. The anterior half of the body was free from macroscopic lesions except in one case which showed some infiltration of the muscles. This is regarded as surprising in view of the fact that four of the beasts exhibited an anterior paraplegia.

Subsequent enquiries as to the probable manner in which the electric current reached the animals showed that it was possible for a short circuit to have occurred at a point where the wires crossed the water pipes. The current then travelled along the pipes to supporting pillars to which the animals were secured by a chain and metal neck collar. The contrast between the marked lesions in the posterior half of the body and their absence in the anterior half is attributed to the fact that, on receiving the shock, the recumbent animals attempted to rise in the manner common to bovines. The muscular masses behind the lumbar region were thus over-stimulated whilst in a state of contraction, with consequent violent damage to skeletal components. The muscles in the anterior half of the body, on the other hand, were in a state of quiescence when they received the shock and therefore escaped. It is opined that had not some factor of this kind been in operation the fore and hind quarters would have suffered equally.

II. Two ewes and six lambs suffered death from lightning-stroke whilst grazing in a field surrounded by a barbed-wire fence. Two pylons for the conveyance of electric current were in the vicinity, although, being newly erected, they were unequipped with cable. The question as to whether such pylons facilitate electrical discharges during thunderstorms is raised and discussed. It is suggested that, if pylons can be proved to play such a part, the increase in their numbers throughout the countryside will add to the risk of lightning-stroke and render necessary the introduction of special measures for their insulation.

—A. A. PRYER.

I. KERNKAMP, H. C. H. (1932). **The Blood Picture of Pigs Kept Under Conditions Favourable to the Production and to the Prevention of so-called "Anaemia of Suckling Pigs."**—*Minnesota Agric. Expt. Sta. Bull.* No. 86. pp. 31. 4 charts, 4 tables. [28 refs.]

II. OLOFSSON, N. E. (1932). Undersökninger över Järnoxidsulfatets verkan mot Bleksot (Anemi) hos Smagrisar. [**Experimental Action of Iron Sulphate against Anaemia of Suckling Pigs**]. *Med.* 412, *Centr.-anst. Försok. Jordbruk. Stockholm.* pp. 38. 24 tables, 3 charts. [15 refs.] [Summary in English : abst. from orig.]

I. In his experiment the author has put research into suckling pig anaemia on a more scientific basis. He studied the haematology of litters of pigs from birth up to 3 months. Sows were confined shortly before parturition, some in covered concrete-floored pens and others in similar pens having about four inches of loam soil (clay, silt and sand, equal parts). The sows suckled their litters and no interference with the diet of the piglets occurred.

The average blood counts and haemoglobin values from nine periods from birth to 3 months of all the young pigs are given : the litters kept on concrete floors showed a definite degree of anaemia in comparison with those kept on soil. The literature on the normal blood picture of swine is reviewed by the author, who describes much of it as valueless, as the environmental conditions were frequently not described. The author prefers not to dogmatize from his own work. His report is carefully composed, with great attention to details of technique, giving his results and quoting the works of others.

II. Observations together with haemoglobin estimations were made on 9 litters of pigs of which 5 were given supplementary iron and 4 left as controls. The test groups showed a progressively rising haemoglobin blood content between the 2nd and 8th weeks, whilst the control groups suffered a marked fall in haemoglobin during the 4th, 5th and 6th weeks ; mortality in these was also higher.

—J. E.

OBERLING, C., & GUÉRIN, M. (1933). Nouvelles recherches sur les ostéites par carence chez les Poules. [**New Researches on Osteitis in Poultry caused by Mineral Deficiency**].—*C. R. Soc. Biol. Paris.* **112.** 1288-1291. [1 ref.]

It had previously been demonstrated by the authors that fowls kept in cages without grit developed bony lesions similar to fibrous osteitis in man. Continuing their experiments they observed cases in which the lesions showed osseous cysts histologically resembling " Recklinghausen's disease " in human beings. Two groups of lesions were recognized and are described in detail. One group showed no cellular reaction of medullary tissue and the lesions resembled those of osteoporosis and osteomalacia. In the second group there was marked cellular reaction of medullary tissue and the lesions were similar to those of rickets and fibrous osteitis. The authors believe the cause to be the same and the variability of lesions to be due to the reaction of the medullary tissue. Experimental work was carried out with 35 fowls which were kept in cages under the following conditions :—(1) birds kept in a common cage with sunlight but without grit ; (2) birds in separate cages in darkness and without grit ; (3) birds in separate cages in darkness, but given grit ; (4) birds in separate cages in darkness without grit, but with vitamin D and (5) in separate cages in darkness with grit and an allowance of vitamin D. It was found that when grit was given the fowls did not develop bony lesions ; when it was not given the lesions observed in fowls kept in separate cages in darkness were similar to osteoporosis and osteomalacia and the character was not modified by vitamin D. Fowls that were kept in a common cage where

daylight was admitted developed lesions similar to fibrous osteitis. Assuming the cause of the lesions to be the same (disturbance of mineral metabolism due to absence of grit), their actual character depends upon external conditions. The authors found the lesions which were produced by a diet deficient in minerals to be accompanied by hyperparathyroidism which, they say, may be due to the disturbance of mineral metabolism.—R. G. LINTON.

STIMSON, A. M., & HEDLEY, O. F. (1933). **Observations on Vitamin A Deficiency in Dogs.**—*Publ. Health Rep. Washington.* **48.** 445-449. 3 figs. on 1 plate. [2 refs.]

Puppies of about 4 lb. weight were used, 12 on a vitamin A deficient diet and 6 controls on a diet with sufficient vitamins. Ten animals in the experimental group developed ophthalmia, one a transient ophthalmia and one showed no ocular lesion. The ophthalmia usually appeared in one eye, and remained unilateral in half of the cases. The onset of the eye condition varied from 6 to 32 weeks. The striking feature of the ophthalmia was its sudden onset. Within 3 days of the first appearance of the symptoms, the cornea would be deeply ulcerated. It is suggested that in vitamin A deficiency profound physiological changes may occur without being detected by available means. It was also observed that the experimental animals developed a foul mouth, with a greyish yellow deposit at the base of the teeth. The deciduous teeth remained for a long time unshed, alongside the erupted permanent teeth. After ophthalmia appeared the animals lost condition. One died of broncho-pneumonia and another of nasal haemorrhage of unexplained origin. Six others died from no other apparent cause than malnutrition. In one case cod liver oil was given after ophthalmia appeared, the dose being 120 c.c. spread over 11 days. The condition cleared promptly and there was no return. Locomotor disturbances occurred, but as these were also observed in the control animals, no significance is attached to them. None of the control group developed ophthalmia.—HENRY DRYERRE.

PUBLIC HEALTH.

YOUNG, T. D., & RABAGLIATI, D. S. (1932). **A Comparison of the Systems of Meat and Milk Inspection in this Country and Abroad.**—*Vet. Rec.* **12.** 1101-1122. [Paper presented at Public Health Section of Jubilee Congress of Nat. Vet. Med. Ass., Folkestone, 1932].

This paper is in two portions, one dealing with the inspection of meat in England compared with its inspection in other countries, whilst the second portion deals similarly with milk inspection.

After citing the relevant Public Health Acts, it is pointed out that England is without a regulated system of meat inspection, each local authority having its powers under the Public Health Acts. The veterinary surgeon has no legal power under the English acts. Provision is made for the appointment of veterinary surgeons as meat inspectors in Scotland, and in Ireland they play a considerable part in the inspection of meat. Brief details of the systems employed in France, Belgium, Germany, Italy, Switzerland, Denmark, Holland, the United States, Canada, New Zealand, Australia, Argentine, Uruguay, Brazil and Chili are given. It would seem as if the inspection of meat in all these countries, with the possible exception of the last, is in the hands of veterinary surgeons, in some cases with lay assistance. In Chili a system of meat inspection by British

veterinary officers has recently been initiated. It is further noted that in several countries, notably Germany, both *ante-* and *post-mortem* inspection, are carried out.

The second portion deals with milk inspection in England as compared with other countries. There are sets of regulations in force for England and Wales, for Scotland and for Northern Ireland. Within these regulations the manner of administration varies locally within very wide limits. The administration of milk regulations and registration requirements as obtaining in most European countries, the United States and Canada are dealt with, and also the regulations dealing with the veterinary inspection of cows and the powers of dealing with bovine tuberculosis in order to render milk safe. Finally the various laws relating to the prohibition of the use of milk from cows suffering from diseases other than tuberculosis are dealt with.

As the title indicates, this joint paper is a wide and useful compilation of data and consequently should be read in the original.—R. Lovell.

Sherman, J. M., & Wing, Helen U. (1933). **The Significance of Colon Bacteria in Milk, with Special Reference to Standards.**—*J. Dairy Sci.* **16.** 165-178. 5 tables. [1 ref.]

The authors discuss the application of the *Bact. coli* test as a sanitary index to raw milk as it is received from the producer or as it is delivered to the consumer by the raw milk distributor. The presence of *Bact. coli* is generally regarded as of significance only as an indication of pollution by faecal matter. Because many varieties which belong to the group are found on plants and mixed feeds given to cows, the presence of the colon group of organisms in milk does not necessarily imply faecal pollution, but the authors consider them to be thoroughly undesirable in milk ; they may sometimes increase in milk. The methods of estimating the *Bact. coli* contamination are discussed and a survey is given of the examination of 450 samples of raw milk. The authors refute the idea that *Bact. coli* organisms do not grow in milk cooled to and held at 50°F. The *Bact. coli* test was checked under controlled conditions ; 220 tests were considered, and in each test the total bacteria and numbers of *Bact. coli* were determined on fresh milk (about 6 hours old), and again at a later period (24 to 48 hours). The work suggests that the *Bact. coli* test is not a satisfactory indicator of the initial contamination, and that it is of no special value as an index to the sanitary conditions surrounding the production of raw milk of usual market grade. This conclusion applies to all raw milks except those which are so handled that bacterial growth is prevented. In high grade raw milks the *Bact. coli* test may have a value as a supplementary index of quality when all the milk is required to be promptly cooled to 45°F., and maintained at this temperature.—R. G. Linton.

Fleischhauer, G. (1933). Zum Tierversuch im Rahmen der Feststellung von Abortus-Bang-Bakterien in der Milch. [**The Biological Demonstration of** *Br. abortus* **in Milk**].—*Deuts. tierärztl. Wschr.* **41.** 152-154. [7 refs.]

The author describes tests for *Br. abortus* agglutinins in the heart blood of guinea pigs that have died prematurely after inoculation to demonstrate *Br. abortus* in milk from suspected cows. Comparative investigations showed that the positive titre from such animals is about one-tenth of that of ordinary blood serum obtained during life.

Preliminary attempts to carry out the agglutination test with juice expressed from muscles or with liver extracts taken from guinea pigs infected with *Br. abortus* were not successful.—F. W. Müller (Berlin).

RENNES. (1932). Le contrôle hygiénique du lait. [**Hygienic Control of Milk**].—*Rec. Méd. vét.* **108.** 565-567.

This is an article on the control of the milk supply in France and the author expresses the opinion that the success which attends the official control of a milk supply depends upon the degree of confidence inspired in the public. The only real obstacle appears to be the refusal of the consumer to pay the necessary price for a milk so controlled.—R. LOVELL.

THERAPEUTICS.

UHLENHUTH, P., MIESSNER, H., & GEIGER, W. (1933). Zur Disinfektion mit natronlaugehaltigen Mitteln bei Virusschweinepest. [**Disinfection of the Swine Fever Virus with Agents containing Caustic Soda**].—*Deuts. tierärztl. Wschr.* **41.** 197-199. 1 table. [8 refs.]

The authors summarize some of the literature dealing with disinfectants effective against various pathogenic viruses and they show how investigations have tended to lead towards the use of caustic soda in a 2 to 3 per cent. solution combined with a 5 per cent. solution of lime.

Experiments upon the efficacy of a commercial preparation " trosilin " are described. This is a caustic soda preparation, usually employed as a 0·2 to 5 per cent. solution. It is a white powder smelling strongly of hypochlorous acid.

The " kidney slice method " was used for testing the disinfectant. Paper-thin slices of kidney from an infected pig were soaked in various concentrations of " trosilin " for a period of one hour. The kidney material was then thoroughly washed, emulsified in saline and injected into pigs whilst control pigs were injected with untreated virus of corresponding strains. Results showed that concentrations below 0·5 per cent. were not effective ; concentrations of 0·5 to 0·75 per cent. generally killed off the virus or lengthened the incubation period and concentrations of 1 per cent. and over killed off the virus with certainty. It is considered that the combination of a 1 per cent. solution of " trosilin " with a 5 per cent. solution of lime and a 5 per cent. solution of sodium chloride would be still more effective.
—E. J. PULLINGER.

I. STRICKLAND, C., & ROY, D. N. (1933). **The Prophylaxis of Malaria by Drugs.**—*Parasitology.* **25.** 77-86. 13 tables. [5 refs.]

II. TATE, P., & VINCENT, M. (1933). **The Action of Plasmoquine on Mosquito-Induced Malaria of Birds.**—*Ibid.* 96-101. 3 tables. [11 refs.]

III. ROW, R., DALAL, N. P., & GOLLERKERI, G. V. (1933). **On the Value of Atebrin in Monkey Malaria.**—*Trans. Roy. Soc. Trop. Med. & Hyg. London.* **26.** 469-470. [10 refs.]

I. Volunteers were infected with *Plasmodium falciparum* and *Pl. vivax*, using *Anopheles stephensi* as carrier. Plasmoquine was given in varying doses before the infecting bite, after it, and both before and after. Quinine, as sulphate and bichloride, was also tried. It is concluded that neither plasmoquine nor quinine has any prophylactic effect on sporozoites and that the effects hitherto observed must be considered to be a therapeutic action on the parasites developing in man.

II. Plasmoquine was effective in preventing or delaying attacks of malaria in birds (hen canaries) infected with *Pl. relictum* by direct blood inoculation but had little or no prophylactic action when infection was by the bites of mosquitoes (*Culex pipiens*).

III. From observations on two monkeys, it was concluded that although

atebrin causes rapid disappearance of the asexual forms of the malarial parasite from the peripheral blood it does not prevent reappearance in virulent form after cessation of dosing.—H. H. GREEN.

POISONS AND POISONING.

SEBRELL, W. H., DEAN, H. T., ELVOVE, E., & BREAUX, R. P. (1933). **Changes in the Teeth of White Rats given Water from a Mottled Enamel Area compared with those produced by Water containing Sodium Fluoride.** *Publ. Health Rep. Washington.* **48.** 437-445. 5 figs. on 2 plates, 2 tables, 5 charts [16 refs.]

A comprehensive summary of the relevant literature is given. In the district of Conway there is a high incidence of mottling in the tooth enamel of children using the municipal water supply. In this investigation, 5 groups of 6 rats each were used. All were on the same basal diet, the drinking water only was varied. Those which received distilled water, or a synthetic water similar to the Conway water, minus the fluorine, developed normal teeth. Those rats which were given Conway water concentrated by evaporation, or distilled water to which sodium fluoride 150 parts per million had been added, developed mottling of the enamel in the lower incisors. When the fluoride was increased to 500 parts per million, it proved toxic to many of the animals. The lower incisors of the survivors became brittle and broke away. The upper incisors grew excessively, curving inwards to perforate the palate.—HENRY DRYERRE.

SCHNEIDER. (1933). Kornradevergiftung beim Geflügel und ihre Einwirkung auf die Legeleistung. [**Corn Cockle Poisoning of Fowls and its Effect on Laying**].—*Arch. Geflügelk.* **7.** 121-132. 4 figs., 1 chart. [11 refs.] [Summary in English : abst. from orig.]

Young poultry up to 6 months old are very susceptible to corn cockle (*Agrostemma Githago*) poisoning, whereas older birds appear to consume the seed freely without harm. Daily doses of 5 to 10 mg. cause symptoms of poisoning. In 4 to 6-month-old fowls, 10 seeds cause drowsiness, ruffled feathers and hanging of the wings within 8 to 12 hours, more than 10 seeds causing, in addition, disturbances in vision and movements, salivation and gastric disorder, whilst 30 to 50 seeds cause death in 24 to 36 hours. The *post-mortem* appearances are not characteristic, nor is there any good means of detection of the seeds or of the active principle, the glucoside githagin, in the organs.

Corn cockle seeds in the food very seriously affect the laying power of pullets.
—G. D. LANDER.

PHYSIOLOGY.

VAN DER KAAY, F. C. (1933). Graviditeitsonderzoek en Hormonen. [**Hormonal Diagnosis of Pregnancy**].—*Tijdschr. Diergeneesk.* **60.** 169-178.

The author describes the Ascheim-Zondek urine test for pregnancy and also the test for the presence of follicular hormone, giving details of the method followed and of the principles involved.

Good results are said to have been obtained with the latter test in horses, the existence of pregnancy being demonstrated with certainty in 98 per cent. of cases by the 9th week of gestation.

The author states that good results were obtained when castrated mice were used as the test animals. HART and COLE found that blood could be used as the test material for the evidence of follicular hormone, the existence of pregnancy being demonstrable from the 5th to the 6th week up to delivery. The hormone was present in maximum quantity about the 80th day.

The tests are less valuable in cattle and pigs and even less so in dogs.

—A. KLARENBEEK (UTRECHT).

GLUD, P., PEDERSEN-BJERGAARD, K., & PORTMAN, K. (1933). Om Graviditetsreaktion hos Hoppen. [**On the Diagnosis of Pregnancy in Mares**].—*Maanedsskr. Dyrl.* **44.** 609-617. 2 figs., 3 tables, 1 graph.

Blood serum and urine of 29 pregnant mares were examined several times from the first few days of pregnancy to the 162nd day. Allan-Doisy's test was applied for the fixation of the folliculine content of the urine, and the Ascheim-Zondek reaction was used for the demonstration of the hypophyseal hormones A and B in the blood serum.

The following table shows the average prolan content of the blood serum at different times :—

	Prolan A.	Prolan B.
47th day of pregnancy	20,000 U. (units)	5,000 U.
67th „ „	30,000 „	30,000 „
82nd „ „	10,000 „	10,000 „

The Ascheim-Zondek reaction was positive in all 29 cases from the 42nd to the 125th day after conception, but in none of 27 control cases as illustrated in the following table :—

No. of animals.	Units of Folliculine per litre urine.	Ascheim-Zondek reactions of serum.
27	Non-pregnant Mares 600 - 5,000	—
29	Pregnant Mares 800 - 30,000	+

—H. LORENZEN (SONDERBORG).

[Compare KÜST (1931). *Deuts. tierärztl. Wschr.* **39.** 761.—who states that the pituitary hormones are not present either in sufficient quantity or regularity in the blood of mares to be useful in diagnosis. He uses the test for folliculin (ovarian hormone) in the blood or urine and claims great accuracy with it.—J. E.].

I. ROBSON, J. M., & TAYLOR, H. (1933). **Factors Influencing the Functional Development of the Male Gonad.**—*Proc. Roy. Soc. London. Ser. B.* **113.** 251-267. 2 figs. on 1 plate, 10 tables. [21 refs.]

II. GARRAULT, Henriette. (1933). Substance glycoprotéique extraite du tissu muco-élastique de la crête du Coq. [**Glycoprotein Extract from the Muco-Elastic Tissue of the Comb of the Cock**].—*C. R. Soc. Biol. Paris.* **113.** 158-160. [4 refs.]

III. ZIMMERMANN, K. (1933). Inkretwirkung verschiedener Kastrationsmethoden. [**Hormonal Effect of Various Castration Methods**].—*Oesterr. Tierarzt.* **6.** 123-124. [4 refs.]

I. It is generally accepted that the pituitary gland controls growth and development of the male gonad, homo-implants of pituitary substance increasing testicular growth. Implantations of bovine anterior lobe extract into rats of Wistar stock caused inhibition of testicular growth and of spermatogenesis. This

effect is partly non-specific, since implantation of suprarenal preparations and preparations of rabbit's heart produced a similar effect.

II. Tissue from the comb of the cock, if extracted with 2% potash and this extract precipitated with alcohol, can be shown to contain true muco-protein.

III. The author indicates the value of castration methods without removal of the testicle, on account of the stimulation of constitution and growth resulting from the resorption of the testicular material by the body. In addition there are obvious surgical reasons for favouring this method of castration.

—E. J. PULLINGER.

DUERDEN, J. E., MURRAY, C. A., & BOTHA, P. S. (1932). **Growth of Wool in the Merino.**—*18th Rep. Direct. Vet. Serv. & Anim. Indust. Union of S. Africa.* Part II. pp. 973-990. 4 figs., 6 tables. [14 refs.]

DUERDEN, J. E., & PALMER, E. W. (1932). **Staple Length Variation and Distribution in the Fleece of the Merino.**—*Ibid.* pp. 991-1003. 12 figs., 1 table. [1 ref.]

Investigations into the growth of Merino wool took place at Potchefstroom from May, 1928, until March, 1930, and clippings were taken from the experimental sheep at regular intervals of 28 days and the animals weighed at similar intervals. The sheep were pastured on grass veldt supplemented by artificial feeding during periods of scarcity: the ages were similar as far as was possible. At the commencement of the experiment, patches about two inches square from both the fore and hind limb of one side of each sheep were completely cleared of wool by shaving with a safety razor. It is claimed by DANFORTH that shaving does not stimulate fibre growth. [Presumably (1925). "Studies on hair, with special reference to hypertrichosis." *Arch. Dermatol. Chicago.* **11.** 494, 637 and 804, and **12.** 76, 195, 380 and 528.—Ed.]

In group A, a small portion of skin with fibres attached was excised monthly and in groups B and C, adjacent separate staples were regularly clipped as close to the skin as possible by means of fine scissors. By holding the unstretched fibres in groups A and B along a millimetre scale, measurement was obtained. In tests on group C a very light tapering scale was found to be satisfactory. The results are fully tabulated, together with the average increase in weight of the animals in the various groups throughout the test period month by month. There appears to be no relationship between the body weight and fleece weight. The average daily straight fibre growth in group A is 0·37 mm., while that of group B is 0·19 mm. The growth is greater in summer than in winter and is slightly greater on the front leg than on the hind one, which confirms the observation that the fleece gradually diminishes in length, being thickest on the fore limb and neck. The classification of wool is based upon the length and quality of the fibre. Wool growth varies in different portions of the animal. Experiments were made by measuring the growth of the fleece with a centimetre steel scale, the fleece being divided into (1) neck; (2) back and sides and (c) belly points and breech. The neck growth was about 10% in excess of that of the body and sides and 25% longer than that of the belly and breech. Growth in areas is not sharply defined. On the live animal, experiments as to the growth of wool were also made, dividing the fleece into three areas, neck, back and sides, and belly and points. The experimental animals were unshorn lambs. Here again the neck wool was found to be longer, being 12% longer than that of the body and about 25% longer than that of the belly. The quality of the wool in these areas is interesting, the best wool, i.e., the finest and most marketable, occurs over the shoulder area, mid-way between the neck and body. The neck wool is invariably stronger than that of the shoulder.

The staple length distribution does not correspond with the quality or thickness distribution. The shortest wool at the hind region is the coarsest. Selective breeding to produce a staple length all over is advocated. The experiments are of considerable value to sheep breeders in the Union of South Africa and elsewhere.

—F. W. MEDLOCK.

LASHLEY, K. S. (1933). **Integrative Functions of the Cerebral Cortex.**—*Physiol. Rev.* **13.** 1-42. 1 table. [7½ pp. refs.]

This communication gives a very full review of the experimental work undertaken to determine the cerebral activities of man and of the lower animals. The majority of problems of cerebral functions centre around activities which are known to have been acquired through some learning process, but the concept of simple conduction pathways from receptor to cortex, with establishment there of an integrative pattern of neuron connections, is a quite inadequate picture of the afferent mechanism.

Some functions lost through cerebral injury may be recovered as a result of special training, e.g. the power of rats to react in a definite manner to light and darkness after removal of part of the cerebrum is as quickly learned as in normal animals. On the other hand, this power is never recovered spontaneously in the absence of training, even although it may have been learned and repeated many times before operation. The recovery of functions lost after destruction of cerebral areas is due to the assumption of the functions by other cerebral areas which did not originally mediate the activities. Some functions, however, are lost completely after removal of the cerebrum, e.g. nest building, collecting and cleaning young, nursing etc. are interfered with by cerebral lesions and appear never to be relearned.

There are indications that, within the entire cortex, for certain functions, and within specialized areas, for others, the subordinate parts are all equally capable of performing the function of the whole.—J. A. NICHOLSON.

TECHNIQUE.

VEENENDAAL, H. (1933). Verzadigde magnesiumchlorideoplosing ($MgCl_2$) een bij het faecesonderzoek voor de praktij geschikte vloeistof voor het aantoonen van z.g. lintwormeieren (oncosphaeren). [**The Use of Saturated Magnesium Chloride Solution in Practice for Faecal Test on So-Called Eggs of the Tapeworm (Onchospheres)**].—*Tijdschr. Diergeneesk.* **60.** 130-133. [16 refs.] [Summaries in English, French and German : abst. from orig.]

The usual method for detecting parasitic eggs in the faeces by suspending it in a saturated solution of sodium chloride, causing the eggs to come to the surface, seemed ineffective for tapeworm eggs, the specific gravity of which appeared to be higher than that of the salt solution. If, however, a saturated solution of magnesium chloride, with a higher specific gravity than that of the onchospheres, is used instead of sodium chloride solution, these eggs rise to the surface. When examining the faeces of carnivora for helminth eggs, the author obtained better results with magnesium chloride than with sodium chloride.

—J. VAN DER HOEDEN (UTRECHT).

EISENBERG, K. B. (1932). Plattenkulturen im Dunkelfeld mit auffallendem Licht (Ultropak). [**Plate Cultures in a Dark Field with Incident Light (Ultropak)**].—*Zlb. Bakt. I. (Orig.).* **127.** 215-216. 1 fig., 1 plate.

Up to the present time, the examination of bacterial coloniès on agar plates

has presented certain difficulties when ordinary microscopic technique is used. The " ultropak " of Leitz-Wetzlar has been designed to overcome these difficulties and a description and illustration of the instrument is given.

By the use of this instrument, colony formation on agar plates can be followed in great detail. It is seen that after a uniform growth in height and width, growth preponderates in width. The origins of actively germinating daughter colonies may also be observed in detail.

The author considers that the " ultropak " fills a large gap in microscopic technique.—A. J. WILSDON.

I. WEISS, E. (1933). **A Simple Method for Staining Fungi.**—*Proc. Soc. Exp. Biol. & Med. New York.* **30.** 466-467.

II. SCHAEFFER, Alice B., & FULTON, M. (1933). **A Simplified Method of Staining Endospores.**—*Science.* **77.** 194. [7 refs.]

I. In this paper the author states that, whereas ordinary dyes are not very successful for staining the mycelium and spores of fungi, better results are obtained if smears are steamed for five minutes with the following mordant before staining. The mordant consists of two solutions, solution A containing 100 g. tannic acid dissolved in 100 c.c. of 95% alcohol and solution B consisting of 92·5 c.c. of 50% formalin and 7·5 c.c. glacial acetic acid. Before use, mix one part of A and two parts of B. Separately, the solutions keep indefinitely. The mordant also improves the contrasting spore staining methods of bacteria when applied to fungi.

II. A search for a simple and efficient method for staining spores has shown that the Wirtz method is superior to others. The authors find that it can be further simplified by introducing certain modifications. They suggest the following technique :—" make films in the usual manner and fix by flaming three times. Flood with malachite green solution and heat to steaming three or four times within one half minute. Wash off the excess stain under the tap for about one half minute. Apply a 0·5 per cent. aqueous safranin solution one half minute. Wash, blot, dry and examine."—GWILYM O. DAVIES.

MISCELLANEOUS.

OLVER, A. (1933). **Points for Consideration in Relation to the Improvement in Live-Stock in India.**—*Agric. & Livestock, India.* **3.** 205-210.

The author, Animal Husbandry Expert to the Imperial Council of Agricultural Research for India, presents his views on the appropriate policy to pursue in the development of the livestock industry in India. The main point of contention is—should breeding be directed towards particular breeds for special purposes or towards the production of dual purpose animals ? The Royal Commission on Agriculture in India (1928) recommended a pure breed, special purpose policy to cater for the separate needs of draught, milk and ghee.

Dual purpose policy has been followed with considerable success—notably in Great Britain—but the work has been slow and has been performed under favourable conditions, such as are not present in India. With the indigenous Indian breeds of the present time, the author believes that the dual purpose policy would be too difficult to pursue and so advises that the existing breeds should be developed along specialized lines. Milk production in India is far below the potential needs of the populace, therefore suitable breeds should at once be developed along strict

dairying lines. Government financial and technical assistance is urgently needed to this end. Improvement of draught breeds is also greatly desirable.—J. E.

COUSINS, H. H. [M.A. (Oxon.), Director of Agriculture, 1908-1932]. (1933). **History of the Hope Farm and Part 1 of the Jamaica Herd Book of Pure Bred Cattle.** pp. 308 + 59. 54 figs. on 29 plates, numerous tables. Kingston : Govt. Printing Office. [fcp].

This book describes the difficulties and problems involved in the building up of a dairy herd in the tropics by the introduction of European breeds of cattle and other means : it summarizes the results of 24 years of constructive effort to develop a livestock industry in the Colony.

The first problem to be successfully solved was the control of ticks and Texas fever. This was done by the introduction of dipping tanks and the use of " paranaph " and arsenite of soda for the destruction of ticks, and the use of injections of trypan blue as a specific for tick fever.

The next problem was the evolution of a tropical dairy cow. Numerous breeds and crosses of European and Indian zebu cattle were tried, and it eventually became apparent that by a suitable blending of the Indian Montgomery zebu breed with the highly productive dairy breeds of Europe a hardy productive cow suitable for conditions in Jamaica could be produced. That is, the hardiness and disease-resisting qualities of the zebu are combined in appropriate proportions with the high producing qualities of European breeds.

Much of the information is given in the form of progress reports from 1910 to 1930, which present a picture of the way in which the problems arose and were dealt with. Notes on pastures, fodder crops and concentrated feeds are given, since the health and production of the animals are largely dependent on improvements in these. Equipment is also dealt with and notes are given concerning the necessity for prevention of the introduction of such diseases as tuberculosis, contagious abortion, and Johne's disease with imported cattle.

A feature of the book consists in the detailed and accurate records of milk and butter fat given by the individual animals and these, together with breeding records and photographs of the animals concerned, supply the facts on which the suitability of various breeds to tropical conditions is decided. The progeny records—daughter-dam comparisons—of all the bulls used form an interesting and important section, since it is through the bulls that the greatest influence on the future of the herd can be exerted. It is a book which should be in the hands of all those who are engaged in the improvement of cattle in the tropics, for the account of experience gained in these pioneer experiments cannot but be of assistance to all those who are in charge of cattle improvements.

—JOHN HAMMOND.

—. (1933). **The Need for Research in Animal Nutrition in the Tropics.**—*Trop. Agric.* **10.** 181-182.

There is evidence that stock feeding in the tropics is based mainly on trial and error. The tendency is to allow the animals to feed themselves, but this uncontrolled range feeding is now seen to be uneconomical. Economic conditions are such that the planter now has a tendency to consider the colonies as a place of more settled residence rather than temporary exile. This means a readjustment in the use of the land and the opening up of areas for the purposes of grazing, so that the supply of fresh meat and milk should be maintained as an internal industry. Many difficulties are in the way, both agricultural and ecological. Chemical analyses of the pastures would show whether the animals should be given mineral

supplements or whether special manuring should be employed. New grasses would have to be introduced and in Jamaica and Queensland, where this has already been done, there has been a great improvement in the beef industry. Experiments are now in progress to find the optimum frequency of cutting fodder grasses. It will also be necessary to carry out further work in order to determine the food requirements of tropical cattle. WARTH found that in Indian cattle the starch equivalent of 100 lb. of rice straw was 40, while the figure for American cattle was 25. Where rations have been worked out, they have usually been based on temperate conditions, and experimental evidence has not justified them for use in the tropics. Investigation is also required on the effect of breed on the digestive capacity of cattle and on their metabolism. Empiricism must give way to scientific deduction.—HENRY DRYERRE.

I. KLEIBER, M. (1933). Tiergrösse und Futterverwertung. **[Size of Animals and Utilization of Food]**.—*Biedermanns Zlb. B. Tierernährung.* **5.** 1-12.

II. ZORN, W., KRALLINGER, H., SCHNEIDER, K. T., & SCHOTT, A. (1933). Relative Leistungsprüfungen an Rindern. I. Wachstum und Futterverbrauch von 9 weiblichen schwarzbunten Rindern von der Geburt bis zur erstmaligen Deckung in Alter von 2 Jahren. **[Production Tests on Cattle. I. Growth and Feed Consumption of 9 Female Animals from Birth to First Service at the Age of 2 Years]**.—*Arch. Tiernährung u. Tierzucht.* **9.** 194-231. 28 text figs., 6 tables. [23 refs.]

I. A general discussion utilizing summaries of new data and of data already published. The extent to which the surface law of animal metabolism is justified is discussed and it is shown that the conclusion often drawn from this law, that large animals utilize food more economically than small ones is, in general, not correct. Two animals are equal utilizers of food if, with the same coefficient of production, their " relative feed capacity " is equal. The term " relative feed capacity " is used to denote the quotient of the maximum food energy which an animal can take in daily and its daily heat loss during fast (basal metabolism). The coefficient of production is the net energy (energy of product) divided by the difference between total food energy and energy for maintenance. The relative feed capacity of chicks, rabbits, sheep, swine and steers is calculated and shown to be approximately the same. Animals, whether small or large, are able to take up daily from 4 to 6 times as much energy in food as they lose daily in starvation (as heat). Hence the efficiency of animals as utilizers of food energy is in general independent of their size. An example is taken from data on two steers to show that individual differences between animals of the same size and race may be more important than differences between small and large animals of different species. Large as well as small animals can yield nearly the same amount of net energy in milk or body substance per day as they lose daily when starving. The maximum amount of energy in an animal's daily production [net energy in the author's sense] is approximately proportional to $w^{\frac{3}{4}}$, where w= body weight.

II. Nine pure-bred cattle were subjected to detailed study (numerous correlation charts) in respect to individual food consumption, weight increase and various body measurements (10 in all). Weight increase from birth to first service at 2 years averaged 414 kg. with variations from 385 to 467 kg. Expressed as " starch equivalent " per 100 kg. of weight-increase, food consumption was 439 kg. ± 10%, the variation of 389 to 467 being regarded as genetic. During a short period of feeding on inferior silage the 9 animals also varied considerably in response, 7 losing weight and 2 maintaining steady gains.

Correlation data indicated that individuals showing the greatest height of

withers in relation to other body measurements were the worst utilizers of food. A definite correlation existed between relative food consumption and chest measurements (depth and circumference behind the shoulder) expressed relatively as percentage of height of withers, and since this relationship can be established by measurements within the first 6 months of life it is possible to judge very young animals in respect to their ultimate capacity to utilize food profitably. The studies on the 9 animals are being continued to provide data on fertility, milk yield, and quality of flesh at slaughter.

[For the reverse aspect, i.e. body measurements of cattle as influenced by specific malnutrition, see DU TOIT & BISSCHOP, this *Bull.* **2.** 169].—H. H. GREEN.

OFFICIAL AND OTHER REPORTS.

GREAT BRITAIN, MINISTRY OF AGRICULTURE AND FISHERIES. (1933). **Report of Proceedings under the Diseases of Animals Acts for the Year 1932.** [KELLAND, P. J. L.] pp. 78. 45 tables, 4 appendices. London: H.M. Stat. Office. [8vo] [1s. 3d.]

In submitting his Annual Report for the year 1932, the Chief Veterinary Officer records two events of special importance which occurred during the year, namely, the appointment of a Committee of the Economic Advisory Council to enquire into the diseases of cattle and the best means of combating them, and the Imperial Economic Conference at Ottawa where agreements were made between the United Kingdom and Canadian delegations under which increased facilities would be afforded for the importation of Canadian cattle into the United Kingdom and for the importation into Canada of pedigree stock from the United Kingdom.

In Part I of his report he discusses the position of Great Britain with regard to contagious diseases of animals. The list of those notifiable under the Diseases of Animals Acts remained as heretofore. Statistical tables are included in an appendix showing the distribution of disease in each county of Great Britain. As regards foot and mouth disease, it is recorded that during 1932 there were 25 outbreaks in Great Britain. This total is the lowest recorded since 1918, with the exception of the year 1930 when only 8 outbreaks occurred. There were 12 new centres of infection and full particulars of these are given. In none of the centres of disease which occurred in Great Britain during 1932 could the origin of the initial outbreak be definitely identified.

The use of serum treatment as an experimental measure for limiting the spread of the disease in field outbreaks of foot and mouth disease was continued. Unfortunately serum has no curative properties and it will not prevent the development of the disease in an animal in the incubative stage. The period of protection of an animal treated with serum is usually about 10 days. During the year under review, serum was used in connection with 11 outbreaks and was administered to 229 cattle, 2,291 sheep and 122 pigs, of an estimated value of £18,337. In four cases disease developed in animals which had been treated with serum, 8, 10, 20 and 24 days after treatment. It is probable that infection had been acquired in the first two cases before serum was injected. In the other two cases, infection was probably acquired after the period of immunity had expired.

It is considered important to repeat that the slaughter of all affected animals and of animals in contact therewith in the same herds—in which the disease will probably already be in the incubative stage—continues to be the basis of the existing policy of eradication. Laboratory investigations have shown that the virus of the disease may be introduced into Great Britain in bone marrow, bacon, vegetable

and other products, sacks, meat wrappers, packing materials and other articles; and that as such virus may remain infective for a considerable period, this country would appear to be in constant danger of invasion by foot and mouth disease.

Bovine tuberculosis is dealt with at some length in the report under review. There are no available figures to indicate the actual extent of the disease among cattle in this country. The present law dealing with this disease is contained in the Tuberculosis Order (1925). The Order is administered by the local authorities for the purposes of the Diseases of Animals Acts. The returns furnished by the local authorities show that during 1932 disease was reported to exist on 22,014 premises in Great Britain. The number of animals examined by veterinary inspectors rose from 216,387 in 1931 to 302,354 in 1932. As the result of such examination, 19,199 cattle were reported by inspectors as coming within the scope of the Order. Of the 19,199 animals, 19,027 were slaughtered by the local authorities, the sum of £68,814 being paid as compensation, that is, an average of £3 12s. 4d. per animal. 3,923 cows were stated to be affected with tuberculosis of the udder or to be giving tuberculous milk.

Swine fever showed a slight decrease, the number of cases enquired into being 11,576, of which 1,555 (13·4%) were confirmed. There would appear to be some difficulty in accurately diagnosing this disease. Enquiries showed that 258 outbreaks were due directly and 519, probably, to market infection. During the year, 1,518 outbreaks of swine erysipelas were reported. Fortunately a satisfactory method of control of this disease is available.

There were 361 outbreaks of sheep scab in Great Britain during the year. The distribution of the disease is carefully described in the report. During the year, 21 sheep dips were approved for use under the order of the Ministry relating to sheep scab and sheep dipping. The application of Parts II and III of the Sheep Scab Order of 1928 during 1931 are discussed. Part III requires double dipping of all sheep in a defined "double dipping area" during a specified period and restricts the exposure of sheep at markets in the area during that period.

During 1932, 201 outbreaks of anthrax occurred in England, 139 in Scotland and 4 in Wales. It is believed that the probable origin of 192 out of 267 outbreaks unconnected with any previous case was the use of imported feeding stuffs. A further reduction of parasitic mange of equines is again recorded, only 127 outbreaks in 36 counties being reported.

Part II of the report deals with the importation of live animals, hay, straw and food-stuffs, and the general regulations for the prevention of the introduction and spread of contagious animal diseases by such means. An important addition to these regulations was made in the Importation of Meat (wrappings material) Order (1932). Certain important concessions were made in the United Kingdom-Canadian Agreement signed at Ottawa on August 20th, 1932, extending facilities for the importation into Great Britain of Canadian store cattle so as to apply to all classes of Canadian cattle. The prohibition of hay and straw from all countries infected with foot and mouth disease was applied to the Union of South Africa on January 26th, 1933, when the disease appeared in that territory.

Part III deals with the protection of animals during transit and the exportation of horses, and Part IV with the export of pedigree and other stock and of raw animal products under the regulations of importing countries. New Zealand still maintained the complete prohibition against stock from Great Britain which has been in operation since 1924. A table shows the number of animals passing through the Quarantine Station, East India Dock, London, for overseas.

The work of the Veterinary Laboratory is referred to in Part VI. It will be noted that of 521 specimens from animals suspected to be infected with anthrax,

481 were from bovines, of which 373 proved positive, and 28 were from pigs, of which 9 proved positive. 21,877 doses of anti-abortion live vaccine were supplied to veterinary surgeons for the inoculation of animals in herds affected with bovine contagious abortion, and 1,125 agglutination tests were carried out in connection with it. The preparation of BCG vaccine for inoculation against tuberculosis was continued and 1,266 doses were issued. Two bovines were immunized against "tristeza" [anaplasmosis and piroplasmosis] prior to export to British Guiana. Research into foot and mouth disease was continued at Pirbright and viruses from Kenya and Southern Rhodesia were examined. Work on the survival of swine fever virus in refrigerated and pickled carcasses and on the influence of "smoking" such carcasses, was continued. An investigation into the antigenic properties of killed cultures of *Br. abortus* was instituted, and the distribution of infection in "carrier" cows was studied. Research into the development of immunity in lambs towards the parasites associated with verminous gastritis was undertaken and the role of the earthworm in relation to the life cycle of *Syngamus trachea* was investigated.—Ll. E. W. Bevan.

Burma. (1933). **Report on the Veterinary Department for the Year ending the 31st March, 1932.** [Mitchell, D. T.] pp. 37. 10 tables, 1 graph, 3 maps. Rangoon: Supt., Govt. Printing and Stationery. [8vo] [3s.]

Staff.—Burma is divided into four circles and an extra sub-circle, each being in charge of a deputy director of veterinary services, two of which are British. There are in addition, a veterinary research officer and a field veterinary research officer, making five Europeans in all. The Burmese and Indian members of the department number 230.

Animal Diseases.—During the year, 60,000 deaths in livestock from all causes were recorded, being much less than in previous years. Rinderpest was present in most districts and 107,000 cattle were inoculated with serum alone in order to control localized outbreaks. Success was marred by lack of co-operation among many cattle owners. Active immunization by serum and virus was impossible owing to practical difficulties in maintaining a strain of virus at a laboratory. Research into the production of a vaccine was started.

Anthrax was widespread over the country and was dealt with by vaccinating elephants, cattle and buffaloes with a spore vaccine.

Haemorrhagic septicaemia and blackquarter showed an increased incidence in riverine areas: the former was dealt with by a dead vaccine as elaborated by the Director [Mitchell (1930). "Interim Report on the Immunization of Draft Animals in Burma against Anthrax"].

Surra was prevalent in the north of Burma.

Foot and mouth disease was widespread, but caused little mortality. The three maps appended show the distribution of foot and mouth disease, rinderpest and anthrax.

Education and Research.—The report of the officer in charge of the research laboratory at Insein and the veterinary college [Pfaff, G.] is included. Veterinary instruction was limited for financial reasons to refresher courses for members of the assistant veterinary staff. Eight educational leaflets were published. The diagnostic and vaccine work of the research laboratory are described. Several horses affected with surra were treated with naganol, which in most cases effected a rapid improvement, but the end results could seldom be followed up. There appears to be a narrow margin of safety in the use of naganol in horses.

Research on the causation of kumri in horses (paraplegia) gave inconclusive results. This disease and osteoporosis require further investigation. New stabling

accommodation is urgently required before much work on large animals can be done.—J. E.

NORTHERN RHODESIA. (1933). **Annual Report of the Department of Animal Health for the Year 1932.** [SMITH, J.] pp. 36. 10 tables, 4 appendices. Livingstone: Govt. Printer. [fcp].

The director retired at the end of the year and one district veterinary officer died, otherwise there was no change in the veterinary staff.

The various branches of the livestock industry remained depressed in tune with the general economic conditions.

LIVESTOCK DISEASES.—A comprehensive survey of the diseases known to occur or to have occurred in the colony is given under systematic headings. Apart from contagious bovine pleuro-pneumonia, the history of which since 1915 is given and which is restricted to the Barotse province, there is no serious disease problem.

Rabies is a rather serious problem and a select committee was appointed early in the year to discuss it: their deliberations form the subject of appendices C and D (pp. 32-36). Evidence was taken and the opinion was formed that rabies is increasing in dogs, being acquired from wild carnivora. Very few cases of human infection have, however, been notified. The committee recommended that all dogs in Kafue and Batoka provinces be registered and taxed; that police patrols be appointed to destroy unlicensed dogs; that a 7 days tie-up order be enforced within a 10 mile radius of any outbreak; that a monetary offer for the pelts of all hyenas, jackals and wild dogs be instituted; that steps be taken to secure co-operation from residents and natives, and that work on the production of a vaccine be undertaken at the central research station, Mazabuka.

The research section of the report contains a very brief account of disease conditions enquired into and returns concerning the diagnostic work done.

The livestock census indicates that there are about 97,000 European-owned and 388,000 native-owned cattle in the colony.

Appendix A gives a list of government notices issued during the year and appendix B a list of the scheduled diseases, 23 in number.—J. E.

CEYLON. (1933). **Administration Report of the Government Veterinary Surgeon for 1932.** [CRAWFORD, M.] pp. 12. Colombo: Govt. Press. [15 cents.]

In addition to the Chief Veterinary Surgeon, the veterinary staff includes 4 Indian veterinary graduates and about 12 other officials.

LIVESTOCK DISEASES.—A bad outbreak of rinderpest, which began in 1930 in the North-Central Province, was still in existence, though being gradually brought under control by general vaccination (spleen pulp vaccine); 6,681 cases were observed during the year. The disease also spread into the bordering provinces, where it was suppressed by prompt vaccination. Mortality in affected cattle was about 80 per cent.

Foot and mouth disease was common all over the island and caused a mortality of about 4 per cent.

Five cases of anthrax, 78 of haemorrhagic septicaemia, 4 of piroplasmosis, 8 of blackquarter and 163 of rabies were notified. Newcastle disease of fowls [here called pseudo-fowl pest] declined during the year as a result of the embargo on importation from India.

ANIMAL HUSBANDRY.—Poultry breeding was increased and assisted by the provision by the government of reliable hatching eggs and breeding stock.

The importation of cattle, buffaloes and goats was prohibited in order to lessen

the risk of disease and to encourage stock breeding in Ceylon : a summary of the new government order to this effect is given. The following are the figures of the animal census returns :—1,074,000 cattle, 541,000 buffaloes, 56,000 sheep and 205,000 goats.

The report concludes with the returns of the government dairy at Colombo and the branch farm at Ambepussa.—J. E.

CUMBERLAND COUNTY COUNCIL. [ENGLAND]. (1933). **Annual Report of the County Veterinary Officer for the year 1932.** [SIMPSON, R.] pp. 16. 3 tables, 1 graph. Carlisle : Steel Bros., Ltd. [8vo].

This report consists of two sections, one dealing with the administration of the Milk and Dairies Acts and Orders, and one with the Diseases of Animals Acts and Orders. The staff consists of the County Veterinary Officer with two whole-time veterinary officers. A panel of local veterinary practitioners is available in cases of emergency. Attention is drawn to the fact that the County Council of Cumberland is one of the comparatively few administrative authorities in England and Wales to carry out a routine system of clinical inspection of milk herds with a whole-time veterinary staff.

In 1931, the number of premises registered in the County for the sale of milk and milk products was approximately 3,500, but as registration is incomplete no figure is shown for the year under review. Wherever possible, routine visits to registered premises are made jointly with the sanitary inspector of the district. In some areas the standard of hygiene and sanitation falls below the general average, and only half-hearted attempts have been made to comply with the order.

As many as 1,963 herds were inspected and 31,118 cows were examined. Attention is drawn to the fact that the present veterinary staff is inadequate to secure the minimum number of inspections recommended by the Milk Reorganization Commission, but to some extent this has been made good by the system of milk sampling, by means of which 424 samples of milk have been collected and examined. Of these 256 (59·2%) have proved "satisfactory," 168 (39·4%) were found to be contaminated but not tuberculous and 6 (1·4%) contained tubercle bacilli. The veterinary inspectors themselves took 257 samples of milk under the Milk and Dairies Order, of which 33 were found tuberculous. Also 152 samples of sputum were collected, of which 81 contained tubercle bacilli. The value of sputum for purposes of diagnosis is emphasized and attention is drawn to the danger of dried sputum which may circulate in the air of the cowsheds and contaminate the milk. Infected sputum may also be swallowed and by passing through the intestinal canal be a means of disseminating the disease.

It may be noted that at the end of the year there were only 5 'certified' herds, 8 grade A (T.T.) and 5 grade A herds licensed under the Milk (Special Designation) Order of 1923, a very unsatisfactory proportion of the dairy herds of the county.

No outbreaks of foot and mouth disease were recorded during the year, but 9 cases of anthrax were confirmed. 32 cases of sheep scab were dealt with; *Br. abortus* infection is said to be a source of much inconvenience and financial loss to farmers in the county.

The County Council is the local authority under the Rats and Mice (Destruction) Act, 1919, and, as hitherto, certain duties in connection with this act have been assigned to the veterinary staff.—LL. E. W. BEVAN.

COUNTY COUNCIL OF DURHAM. [ENGLAND]. (1933). **Annual Report of the Chief**

Veterinary Officer for the year 1932. [PEELE, H.] pp. 42. 2 graphs, 10 tables. Durham : Walkergate Printing Works. [8vo].

The Veterinary Department of the County of Durham, consisting of the Chief Veterinary Officer, 4 whole-time veterinary officers and certain veterinary practitioners working on a part-time basis, deals with the veterinary work in connection with the Milk and Dairies Acts and Orders, and is also responsible for the veterinary duties carried out by the County Council under the Diseases of Animals Acts and Orders. The routine clinical veterinary inspection of dairy cattle, combined with the microscopic and biological examination of milk from suspected tuberculous animals, is having a very marked effect upon the general standard of the milk supply. Incidentally it leads to improvement in the general health of the cattle in so far as it prevents, to a great extent, the spread of tuberculosis by contact.

The county is divided for inspection purposes into 4 veterinary areas, each in charge of a member of the whole-time veterinary staff. In each area one or more veterinary practitioners are employed when any special emergency arises.

A table shows that 38,851 cows were examined under Part IV of the Milk and Dairies Order (1926), which involved 4,025 visits to farms. In all, 239 cases of tuberculosis were detected by the veterinary officers in the course of routine inspections and 192 were reported by their owners, making a total of 431 which were slaughtered under the Tuberculosis Order of 1925. Of these, 191 were affected with tuberculosis of the udder ; 16 were suffering from tuberculous emaciation and 222 from other forms of the disease.

There were in the county during the year 3,100 registered dairy herds. At the beginning of the year 19 premises were licensed for the production and sale of grade A milk and 7 new licences were issued during the year, while 2 were abandoned. Some 46 samples of milk were taken from licensed herds and, of these, 6 were found not to comply with the conditions laid down in the Order. In 3 instances tubercle bacilli were found to be present. The report outlines the other duties of the department in connection with the scheduled diseases governed by the various Acts and Orders, and gives interesting details of the methods adopted. It should be studied by all those interested in such work.—LL. E. W. BEVAN.

I. —. (1933). Rapport sur le Fonctionnement du Laboratoire de Recherches Vétérinaires des T.O.M. en 1932. **[Report on the Work of the Research Laboratory of the T.O.M. (Troupes d'Occupation du Maroc?) in 1932].** [VELU, H.]—*Rev. vét. milit.* **17.** 121-127. [15 refs.]

II. —. (1933). Rapport sur le fonctionnement du Laboratoire de recherches du Service de l'Élevage du Maroc pendant l'année 1932. **[Report on the Work of the Research Laboratory of the Livestock Service of Morocco for the year 1932].** [VELU, H.]—*Arch. Inst. Pasteur, Algérie.* **11.** 252-265. [26 refs.]

[These two reports deal with the same work].

This laboratory performs diagnostic and research work into livestock diseases of Morocco.

Work was performed on the following diseases :—bovine piroplasmosis and anaplasmosis against which gonacrine was found valuable ; dourine, against which naganol was tested (work unfinished) ; equine infectious anaemia, investigation being followed into improved diagnostic methods ; anthrax, for the control of which in horses the single intradermal vaccination was found most satisfactory ; " darmous," concerning which further progress in aetiology was made, the toxicity of fluorine in the waters of the phosphate rock areas being found to be greater than

previously supposed ; Moroccan natural phosphate should not be used owing to its harmful fluorine content ; work was also performed on testicular grafting in sheep and phosphates in the nutrition of cattle and sheep.

The work of the diagnostic and serological department is described. References to the results of research performed and published are also given.—J. E.

—. (1933). Hygiène Méditerranéenne 1er Congrès International. Marseille 20-25 Septembre, 1932. [**First International Congress of Mediterranean Hygiene. Held at Marseille, Sept. 20th to 25th, 1932**]. 2 Volumes. pp. 777 and 759. 95 figs., 4 plates. [Numerous refs.] Paris : J.-B. Bailliere et Fils.

The object of this Congress was to discuss the human infectious diseases occurring in countries bordering on the Mediterranean Sea.

The two volumes of reports present the original papers and discussions, which cover a wide range of sub-tropical pathology with particular attention to leishmaniasis, undulant fever and typhus fever.

Papers relevant to the veterinary point of view will be abstracted for this *Bulletin*.—J. E.

BOOK REVIEWS.

KELSER, R. A. [D.V.M., A.M., Ph.D. : Officer in Charge, Vet. Division, U.S. Army School ; Member of Staff Path. Division, Bureau of Anim. Indust., U.S. Dept. Agric.] (1933). **Manual of Veterinary Bacteriology.** pp. ix + 552. 93 figs., 11 tables. [372 refs.] London : Baillière, Tindall & Cox. [8vo] [27s. 6d.]

The new edition of this text-book will not be found to differ very materially from the first edition. A chapter on bacterial variation has been added and the introductory chapter to the section on the protozoa has been rewritten. Chapters are now given dealing with the bacterial genera *Flavobacterium*, *Klebsiella*, *Shigella* and *Leptospira*, the last named having been a noteworthy omission from the first edition. The genus *Pasteurella* now appears in its proper order in classification. The genus *Brucella* has been separated from *Alkaligenes*, leaving *A. bronchisepticus* with the latter genus.

Many minor improvements have been made. *Br. abortus* is dealt with more fully, the causal organism of braxy is now recognized as *Clostridium septique* and not a separate species, the species of the genus *Corynebacterium* are increased in number, *Vibrio fetus* and *Bact. viscosum* are dealt with, and the virus diseases are amplified. A welcome change is to find generic and specific names of organisms given in italics. Mistakes in the first edition have been corrected, as, for example, that epizootic lymphangitis occurs in England and that laboratory animals are not susceptible to foot and mouth disease. The illustrations remain practically as in the first edition ; some might be more typical from a teaching point of view ; for example Fig. 64 is not very distinctive of *Mycobact. tuberculosis* and the same can be said of Fig. 50, a colony of *B. anthracis* on agar.

Notwithstanding these criticisms the student will find that the new edition is an improvement on the old and forms a useful work of reference.—S. H. GAIGER.

BENESCH, F. [Professor of Obstetrics at Vienna Veterinary College]. (1933). Die Geburtshilfe bei Rind und Pferd. [**Obstetrics for Cattle and Horses**]. pp. viii + 224. 94 figs. Berlin & Vienna : Urban & Schwarzenberg. [8vo] [RM. 8.50 bound].

This is an excellent text-book on practical obstetrics relating to the cow and the mare and gives systematic instruction on the manipulative correction of malpresentations and other abnormalities causing foetal dystocia. As epidural anaesthesia, first developed by the author some 6 or 7 years ago, removes the main hindrance to obstetrical work, the chances of being able to secure delivery of the foetus *in toto* are greatly increased, so that the necessity of performing embryotomy is correspondingly greatly decreased.

After opening chapters on general considerations in obstetrical work, epidural anaesthesia, equipment for manipulative obstetrics, rules for the technique of handling parturition cases, definition and causation of dystocia and the way to deal with oversize foetuses, the rest of the book, 150 pages, is devoted to a system of correcting malpresentations by bloodless methods relying entirely on manipulation aided by ropes, repellers, blunt hooks, etc. Good figures are indispensable in such a book and in this case they are remarkably successful in illustrating the stages of procedure ; they are even so well planned as to be instructive for those unable to read the German text if they use a dictionary for the captions.

In opposition to some other writers on obstetrics, the author favours forced extraction in certain cases and advises against embryotomy until that has failed. If the foetus is dead, one is inclined to quarrel with this teaching, particularly in view of the great advance in recent years in the wire saw and other types of embryotome.

The system of this book is, of course, that of the Vienna school and does not include all the alternative methods now taught in the representative veterinary colleges of Europe and America.

The book is a useful addition to the rather scanty modern obstetrical literature and should be very successful.—J. E.

KRAUSE, C. [Professor and Director of the Veterinary Pathological Institute of Sofia University]. (1933). Lehrbuch der Sektion der Haustiere. [**Textbook of the** *Post-Mortem* **Dissection of the Domestic Animals**]. pp. viii + 275. 57 figs. [31 refs.] Berlin : Urban und Schwarzenberg. [8vo] [RM. 10.50].

This book was planned by the author many years ago when he was assistant at the Pathological Institute of Berlin Veterinary College. As professor in the Veterinary School at Sofia, he has had the opportunity of completing the work for publication.

It is a systematic book of instruction for the performance of *post-mortem* examinations on domestic animals and it gives in great detail the required information on the *post-mortem* appearance of the normal organs of the horse, ruminant, pig, dog and fowl with a definite system of procedure in dissection and examination. The general scheme of the dissection of the mammalian body is first described and is followed by special sections on the different animals named above.

The different aspects of technique are discussed—the *post-mortem* room with its fittings and the instruments required, the systematic recording of the findings, the preservation of organs for further investigation, including preparation as museum specimens, the aid of photography in pathological work and the economic disposal of carcasses.

The numerous figures and photographs are excellently reproduced and very helpful, and the arrangement of the text with contrasting type print makes the book excellent for reference purposes. Selected references are given at the end of each chapter and there is an index to the volume.

The book is certain to enjoy a wide popularity in the German-reading veterinary world.—J. E.

COLE, S. W. [M.A., University Lecturer in Medical Chemistry, Cambridge]. (1933). **Practical Physiological Chemistry.** pp. xii + 419. 71 figs., 41 tables. [24 refs.] Cambridge : W. Heffer & Sons, Ltd. 9th Edition. [8vo] [12s. 6d.]

It is five years since the last edition of this text-book was published, and the author has revised and rewritten the greater part of it. Though written primarily for natural science and medical students, those with veterinary interests will find it a useful compendium of biochemical analytical methods. This is especially true of the chapters on urine and blood analysis.

One of the main changes in this new edition is the elimination of many alternative methods for quantitative analysis, the one most suitable for the student being left. The usefulness of the book has been greatly increased by the expansion of the chapters dealing with determination of pH concentration and the properties of the proteins, though some readers may disagree with the author on his changes of the nomenclature of some of the standard colour reactions of the proteins. In view of the ever-growing volume of literature dealing with this important branch of medical and veterinary science, the author must be complimented on his success in keeping up to date and yet reducing the size and price of his text-book without sacrificing its usefulness.—JAMES STEWART.

LYON, W. E. [Major]. (1933). **First Aid Hints for the Horse Owner.** pp. vii + 128. 59 text figs., 5 plates. London : Constable & Co., Ltd. [8vo] [8s. 6d.]

The sub-title of this book is " A Veterinary Notebook " and much of the text has evidently been taken from three books on stable management by veterinary surgeons. The book is the work of a layman, and, as one would expect, the moral to be drawn is that " a little learning is a dangerous thing."

About three-quarters of the book deals with the common diseases of hunters, the names of the individual conditions being set out in red ink, a good way of securing clarity. This has also been employed in showing the sites of disease in the numerous line drawings. The author tries to cram too much text-book detail into limited space, with the inevitable increase in confusion to the reader and omission of important points for consideration with direct bearing on the choice of mode of treatment.

The intelligent horse owner may find the book useful as a guide to first-aid treatment of conditions easily recognized by horsemen, but would be ill-advised to try and establish diagnosis by reference to it, as many figures are misleading by omission of important points or by error. Naturally the book does not bear detailed criticism by a veterinary surgeon. The parts on stable management are orthodox and useful. The artist has done very well on the whole, apart from shortcomings due to limitation of veterinary knowledge. The book is very well printed in good large type.—J. E.